GHT, JANUARY 7, 1937 FIRST AERO WEEKLY IN THE WORLD REGD. AT THE G.P.O. AS A NEWSPAPER

JAN 26 1937

# FLIGHT

The AIRCRAFT ENGINEER AND AIRSHIPS

1463
XXXI

OFFICIAL ORGAN OF THE ROYAL AERO CLUB

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The AIRCRAFT ENGINEER AND AIRSHIPS

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## Mediterranean Amity

THE signing of an agreement between Britain and Italy on the situation in the Mediterranean is a further step towards the preservation of European peace. It must also be a great relief to the naval and air staffs of both countries. Fraught with danger as is the attitude of Italy (as well as Germany) towards the struggle in Spain, the Italian Government must in its serious moments be intensely anxious for peace. Victory in Ethiopia has brought to Italy great possibilities in the future, but it has also brought liabilities. The conquered country must still be occupied by an army, and the communications between this force and its homeland lie through the Suez Canal. It is the most fragile line of communications which could well be imagined, and if the worst came to the worst the few and not very adequate harbours in Italian East Africa would come under fire from air squadrons in Aden and British Somaliland, to say nothing of the British Fleet. The harbour of Massawa is of more vital importance to Italy than are any of the neighbouring British ports to the British Empire, and so Italy would stand to lose far more than she could possibly gain by a conflict with Britain. To both Powers the Suez Canal is of vital importance, but it is not too much to say that its blocking would be more immediately disastrous to Italy than it would be to the British Empire. Count Ciano must, therefore, be well pleased with himself at having negotiated an agreement with Britain.

### *Welcome Relief*

On the other hand, we British are intensely desirous of peace, not because we fear defeat if we were obliged to fight, but from an innate hatred of war as a disaster, and from an intense longing to pursue our steady progress towards economic prosperity and a happier and fuller life for our peoples. We continue to arm ourselves with all speed, having realised, what our rulers ought never to have forgotten, the truth of the old maxim, *si vis pacem, para bellum*, and as each month shows us more formidable and less liable to fall victims to a sudden onslaught we breathe deeper sighs of relief. But tranquillity of mind was not possible so long as the Mediterranean was full of rancour. Unpleasant possibilities were discussed in the case of a victorious General Franco ceding some Spanish islands, either the Balearics or the Canaries, to Italy. In the hands of a hostile Italy either of those groups could have formed air bases which would have lain beside our sea routes to other British lands. The assurance that Italy is not seeking the acquisition of Spanish possessions is unquestionably a considerable relief.

### *Still Necessary*

The removal of the chance of trouble to the dim future does not make it possible to neglect precautions. There can be no doubt that the measures already decided upon, such as the refortification of Malta and the establishment of Air Force and naval bases in Cyprus, will be carried out. The East African Colonies will still need air garrisons of some strength, and probably General Purpose squadrons will not be thought adequate for the purpose. It would not be surprising to see the single bomber squadron at Aden reinforced by one or more units. The R.A.F. strength in Egypt may be doubled under the new treaty, and this will probably be done. All these measures can now be carried out at leisure and can more or less wait until the Metropolitan Air Force has achieved its 1,750 first-line machines. This must lift a considerable load off the shoulders of Marshal of the Royal Air Force Sir Edward Ellington, the Chief of the Air Staff. Things are going very well under his direction, but any relief from anxiety must be most welcome.

The signing of this agreement is a very good start to the new year. If only the Spanish civil war could be brought to an end. . . .

# The £100 Aeroplane

ON the Correspondence page (p. 16) we publish a letter from a *Flight* reader who is typical of very large numbers of aviation enthusiasts to whom the absence of really cheap aeroplanes is a source of never-ending wonder. They very naturally look at the present-day cheap motor car, with its pressed-steel bodywork, its steel frame chassis which carries a great deal of relatively complicated mechanism such as engine, clutch, gear box, propeller-shaft, differential and so forth, and its comparative luxurious interior, complete with much "navigational" equipment, and they ask themselves why it is that as soon as a man wants to get into the air, even on the simplest contraption of plywood and linen fabric, he has to pay three or four times as much for the privilege.

The question is quite natural. On the face of it, there is no reason why this state of affairs should persist. Goodness knows that plywood and fabric are cheap enough in all conscience. Then why, in the name of commonsense, should the putting together of these two materials always mean high cost?

Our correspondent points out that an engine can now be bought for about £55, and asks why a small light airframe cannot be built for £45, and the whole outfit sold for £100. He forgets that, to begin with, the engine is cheap because it is a motor car engine manufactured in enormous numbers, of which a minute percentage are side tracked into the aviation industry. The cost of designing the engine, building the first few experimental units, testing them, "getting the bugs out of them" and generally developing them to a stage of perfection good enough for car work, had, by the time it came to be used in light aeroplanes, been spread over thousands of units.

With the airframe itself the position is that it has not been produced under similar conditions. If it had, it would probably, by now, have a metal monocoque fuselage, and wings of simple metal construction needing a minimum of riveting or other forms of assembly.

There are but two ways in which a small aeroplane can be made very cheaply: either by being built by amateurs, who do not count the cost of the time they put into the work, or by being produced in quantities comparable with those in which motor cars are turned out. It was not until Mr. W. R. Morris (now Lord Nuffield) spent thousands in building large factories and equipping them with costly machinery that he was able to bring the price of his cars down to the level which made them famous. While cars are turned out in small quantities they must be comparatively expensive.

Unless some wealthy person or company decides to invest hundreds of thousands of pounds sterling in a factory and to produce thousands of aeroplanes by real mass-production methods, there is little chance of reducing the price to anything like the £100 level. And it would require a great deal of courage to do that. There is no sort of guarantee that the market would absorb these thousands of machines. For one thing, learning to fly well is far more difficult, and takes much longer, than learning to drive a car, and the amount of utility service which can be got out of an aeroplane is far smaller than that which is expected and accepted without question from almost any sort of a car.

So, all you enthusiasts, we are sure you see the point. Or don't you?

**THE MOUNT OF TEMPTATION:** The wilderness of Judæa, where once Elijah and John the Baptist lived the lives of hermits, is a grim and forbidding tract of country. In this picture three Harts pass lightly by the traditional scene of the Temptation, but it is no place for the airman's ideal of "happy landings."

# The Outlook

## A Running Commentary on Air Topics

### The South Atlantic

MANY months have passed since the possibility of a British West African and South Atlantic service was seriously considered. We knew then (though not officially) that a subsidy would probably be forthcoming if and when the two interested air transport concerns, British Airways and British Continental Airways, could see their way to pool their resources More accurately, perhaps, it seemed obvious that neither of the separate tenders was likely to be considered—particularly after the feelings engendered by the allocation of the Scandinavian mail contract.

When, therefore, the amalgamation of the two companies was announced we all felt that the South Atlantic service would be inaugurated in due course. Nothing further has been heard of the project, and it would seem that even the amalgamation is still a matter for conjecture. It is possible to guess at the nature of the particular differences of opinion which are causing what we hope is only a temporary hold-up—but the pages of a technical paper are not the place for guesses. Nevertheless, it would seem that someone or other will have to give way as graciously as possible for the sake of air transport as a whole. The present position is ridiculous.

Meanwhile, neither the air transport companies nor ourselves have forgotten the continued injustices of the booking agents' ban on companies outside the railway clearing house "ring." We shall continue to do our small part by returning to the subject at regular intervals until something *is* done about it.

### Westward Ho!

THE explosives departments of Woolwich Arsenal are shortly to be moved to new arsenals at or near Chorley (Lancashire), Bridgend (Glamorgan), Irvine (Ayrshire), and Hereford. Some superficial thinkers have been writing in the papers that as the increasing endurance of aeroplanes will soon put all parts of the British Isles within the range of a Continental enemy, there is no great advantage in moving westward.

Such a view overlooks the fact that the passage of raiders across England, even for half an hour, very greatly increases the chances of the defence. The course of the raiders can be followed and plotted, and time is given for guns and fighter aeroplanes to get ready for them . Perhaps some day the range of the bombers may be so great that they will fly all the way round by sea and attack from the west, but we need not tackle that hurdle until we come to it. What is of more immediate concern is the removal of the R.A.F. experimental establishments from Martlesham and Felixstowe to the West Coast, and it is to be hoped that this step will not be long delayed.

### The Half-yearly Promotions

RESPECTFUL congratulations are offered by *Flight* to Sir Edward Ellington on being the third officer in all the world to attain the rank of Marshal of the Royal Air Force. Would that the title were a little less cumbrous! Years ago someone in a position to judge remarked that "Ellington is the finest staff officer in the Empire." The R.A.F. has certainly been fortunate in having an officer of that stamp as Chief of the Air Staff when the fury of expansion burst upon it. Under the guidance of this master hand all has gone smoothly, and the increase of the R.A.F. in the last two years has been one of the greatest marvels ever achieved by British organising genius.

It would, of course, be impossible to notice all the officers in the list of half-yearly promotions, but a few names are of general interest. Among the new Air Commodores are C. H. B. Blount, who for many years has been a shining light of Army co-operation, and R. Leckie, whose fights and adventures as a pilot at the R.N.A.S. station at Great Yarmouth make stirring reading for the younger generation. Two Naval officers of the Fleet Air Arm are promoted to Wing Commander and will presumably become officers in charge of flying on carriers. They will not have to be taught the A B C of their duties when they take over.

### "Twins" for Carriers?

NOT many years back any talk of using monoplanes for carrier operation was received in the same vein as schemes for rocket-propelled air liners. But they have come: the American Navy has ordered Vought and Douglas ship-planes of completely modern monoplane design which are said to make an excellent showing on every score against comparable landplanes. A new crop of prototypes is almost due to appear in this country, and doubtless the monoplane formula will be well represented, if not exclusively adopted.

Soon we may see multi-engined types at sea with naval air arms, for France, certainly, and America, so it is said, are experimenting with twin-engined monoplanes planned for deck landing. For a given all-up weight the dimensions of modern monoplanes are being kept very small through the adoption of high wing loadings and lift-increasing devices, and the introduction of twin engines may confer considerably greater striking powers on the carrier-based aeroplane.

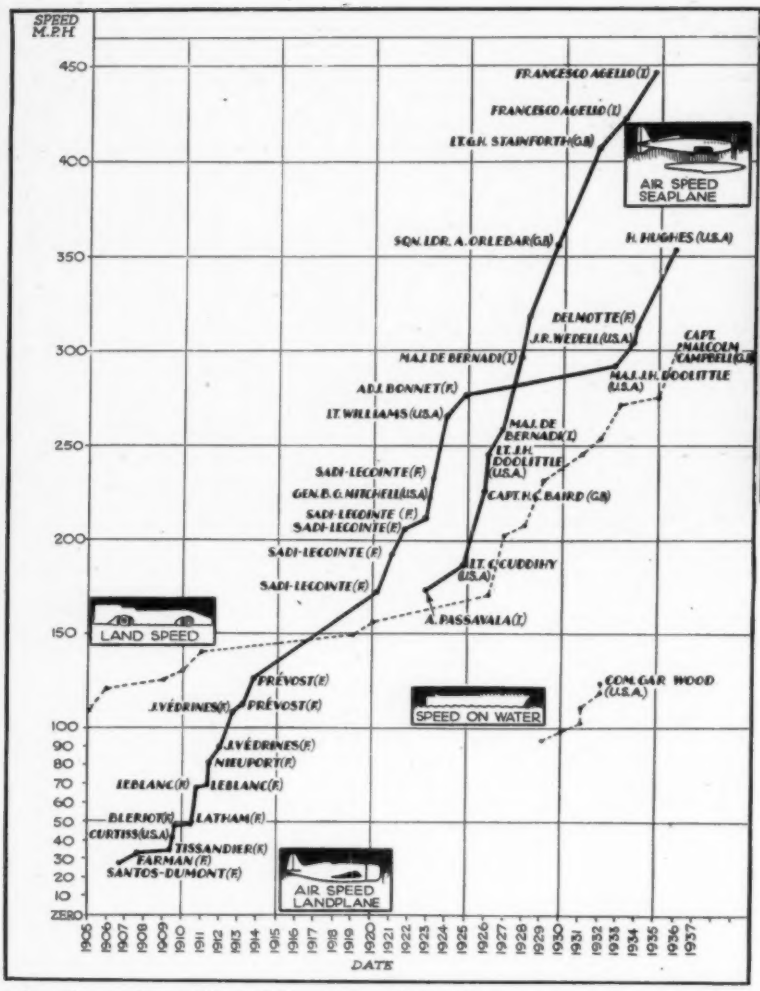
### Overweather

STRANGE terms follow the adoption of new devices and techniques, ever swelling the aeronautical lexicon of jargon. It is easily understood why many of them are of transatlantic origin; not only do most important innovations (as witness retractable undercarriages, variable pitch airscrews, flaps and stressed-skin construction) find their first wide, practical application in the "States," but their exploiters have the happy knack of describing in a word or phrase what we ourselves would despair of delineating in anything more concise than a young treatise.

The latest flower to bud in the columns of the American technical press is "overweather," coined by the Transcontinental and Western Air (T.W.A.) concern to denote operation at altitudes which are generally free from storms and turbulence.

"Overweather" research flying with a Douglas D.C.1 and a Northrop Gamma has provided some encouraging data. The day when transports fly regularly in the neighbourhood of 30,000 feet seems nearer than is generally realised. Provision is being made in the forty-passenger monoplane taking shape in the Douglas shops to "bleed" oxygen into the ventilation system, but for real "overweather" work, according to T.W.A., "supercharged" cabins will be indispensable.

So long as intriguing new terms like "overweather" continue to signify that pioneer work is being done for the advancement of commercial flying, they will come gladly to our lips.




**How the maximum air speed has progressed year by year. Land and water speed records form an interesting comparison.** (*Flight* copyright.)

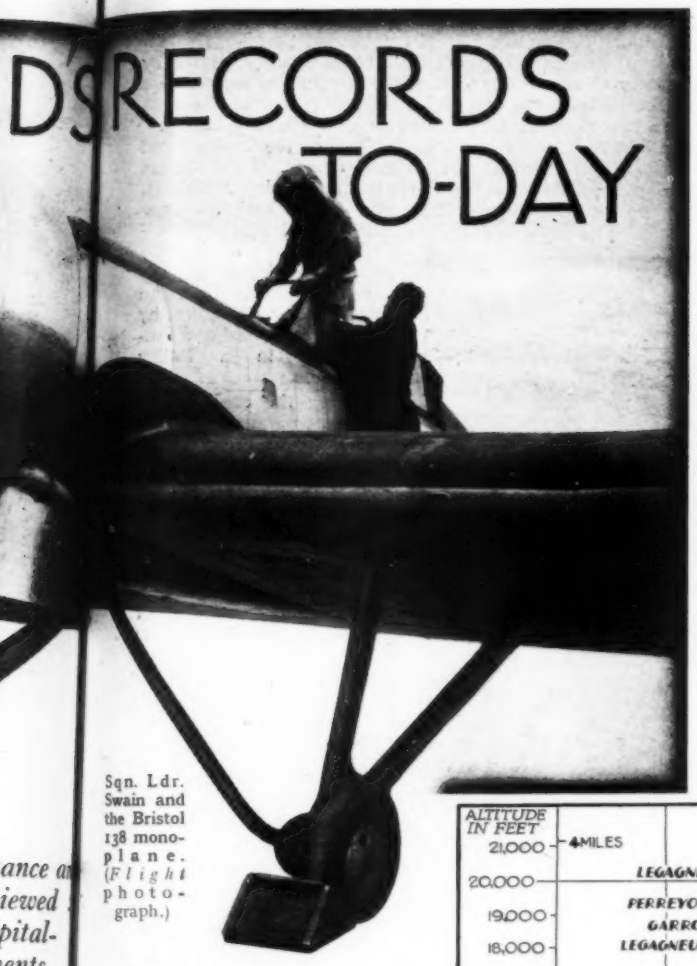
## *International Speed, Distance and Altitude Figures Reviewed : Trans-oceanic and Capital-to-Capital Achievements*

WORLD'S air records fall naturally under two headings (a) the ultimate records for speed, distance or altitude—these are generally confined to the "specialists"—and (b) the long-distance "speed" flights, which may or may not be official records, but are recognised as the best time for the journey. The latter are the pursuit of the few more adventurous and independent spirits in flying.

Before considering the subject as a whole, it is desirable to eliminate the efforts which can serve no useful purpose. People have been known to sit for forty days on top of flag-poles, or roll peanuts up mountain-sides with their noses. Fortunately, aviation has almost entirely escaped this type of "stunt" and notoriety.

Great interest is always shown in a person or machine that can do something better or faster than any other in the world; and, usually, advertisement is the underlying incentive for a record attempt. Perhaps a manufacturer desires to advertise to the world at large the

**The D.H. Comet with two Gipsy Six R engines is perhaps the most successful long-distance racing type of recent years.** (*Flight* photograph.)




Sqn. Ldr. Swain and the Bristol 138 monoplane. (*Flight* photograph.)

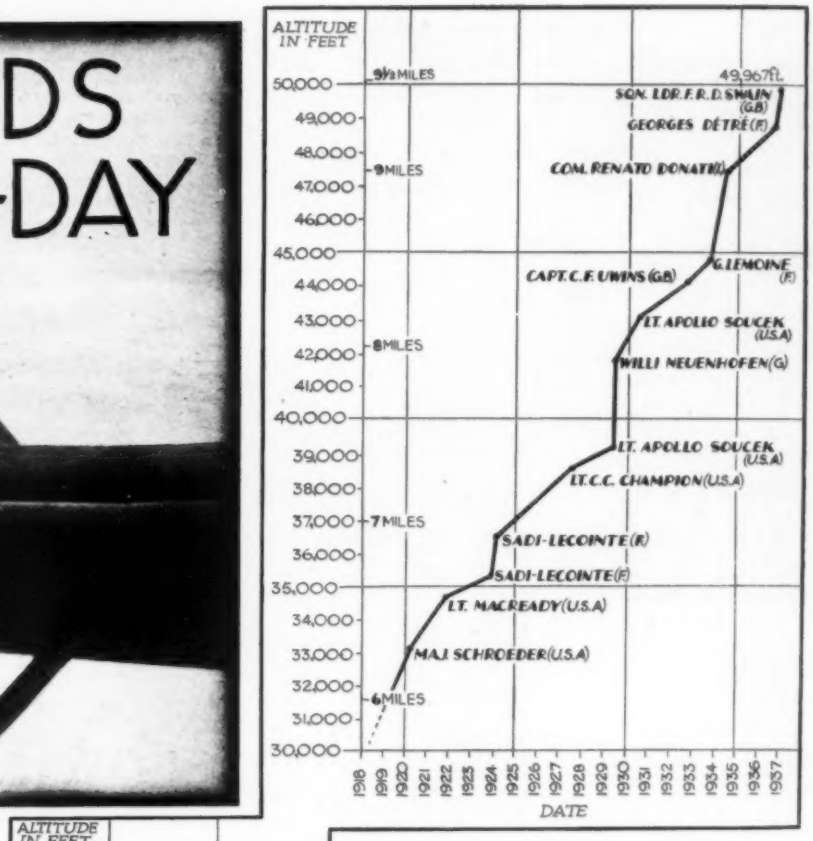
reliability of his products; a successful long-distance record will focus public interest, and the comments and descriptions will supply the advertisement. Other feats could be devised to demonstrate some particular or unique characteristic.

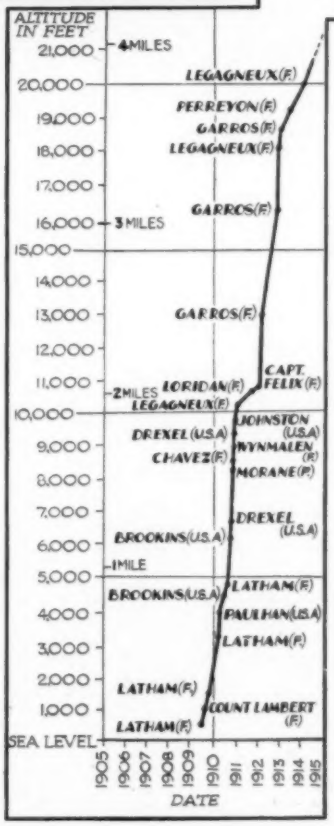
It is, perhaps, strange that one of the most difficult of non-stop long-distance flights, according to modern standards, was the first to be attempted. On May 18, 1919, H. Hawker and Lt.-Cmdr. McKenzie Grieve took off from St. John's, Newfoundland, flying the Sop-with-Rolls-Royce "Atlantic." Before leaving the coast they jettisoned their undercarriage. This was the first attempt in the Atlantic race for the £10,000 *Daily Mail* prize. After flying for fourteen and a half hours, "Atlantic" and Atlantic were compelled to meet some 750 miles from the Irish coast. The pilots were fortunately picked up by a passing vessel.

Capt. J. Alcock and Lt. A. Whitten Brown made the first non-stop Atlantic flight one month later, during June 14-15, 1919. Flying a Vickers Vimy with two Rolls-Royce Eagle engines of 350 h.p. each they completed the crossing to Ireland in 16 hr. 12 min.

In the following July the airship R.34 made crossings both ways, but from then until 1924 no further attempts were made. The *Graf Zeppelin* and *Hindenburg* have now settled down to a regular German summer trans-atlantic service, while in England we wait impatiently for the time when the Empire flying boats will challenge the Zeppelin supremacy.

Among other aircraft North Atlantic flights have now been made by a D.H. Dragon, Puss Moth, Lockheed Vega, Percival Vega Gull, Stinson, Fokker, Junkers, Breguet, Douglas, Dornier, Savoia-Marchetti, Bleriot, Vultee and Bellanca. The last-named aircraft, it will be remembered, was flown by J. A. Mollison from Newfoundland to London in 13¼ hours. This is the best time recorded. Of other Atlantic flights, the salient points are (a) the fact that three women were among the pilots, Mrs. Amelia Earhart Putnam (solo), Mrs. Amy Mollison, and Mrs. Markham (solo) (portraits and a list of achievements of these and several other pilots appeared in *Flight* last week). (b) The fine solo flight made by J. A. Mollison in so small an aeroplane as a Puss Moth with four-cylinder Gipsy engine. (c) That on the




This graphic representation shows how the aviation beanstalk has grown from feet to miles. (*Flight* copyright.)

**Two women record holders whose names appear in the table below. (Above): Mlle. Maryse Hilz. (Right): Mrs. Amelia Earhart Putnam seen with the Lockheed Electra "Flying Laboratory" belonging to Purdue University.**

Vultee, with supercharged 1,000 h.p. Wright Cyclone engine, Richman and Merrill for the first time took advantage of the added power and range made possible by the use of 100-octane fuel. It is interesting to note that Richman holds the amphibian altitude record at 18,641 ft. in a Sikorsky aircraft with Pratt and Whitney engine.

Bossoutrot and Rossi hold for France the international long distance record over a closed circuit. On a Blériot 110 monoplane they flew 6,587.4 miles during March 23, 24, 25 and 26, 1932. Rossi and Codos hold the long-distance "line flight" record on a Blériot-Zappata, having flown 5,657 miles. Previously the record was held at 5,308 miles, by Sqn.-Ldr. Gayford and Flt.-Nicholetts in a Fairey monoplane.

Among the continent-to-continent and capital-to-capital flights, record time from England to Australia has been lowered on no fewer than twelve occasions, and thirty-six British flights have been completed. The aircraft flown vary from an Avro Avian with 80 h.p. Cirrus engine and a Comper Swift (80 h.p. Pobjoy R) to a 200 h.p. Gipsy Six Percival Gull and D.H. Comet (two Gipsy Six R), the last-named having a total of 448 h.p. The D.H. Comet flown by C. W. A. Scott and the late T. Campbell Black in the MacRobertson race set up the present record time of 2 days 23 hr. 18 sec.

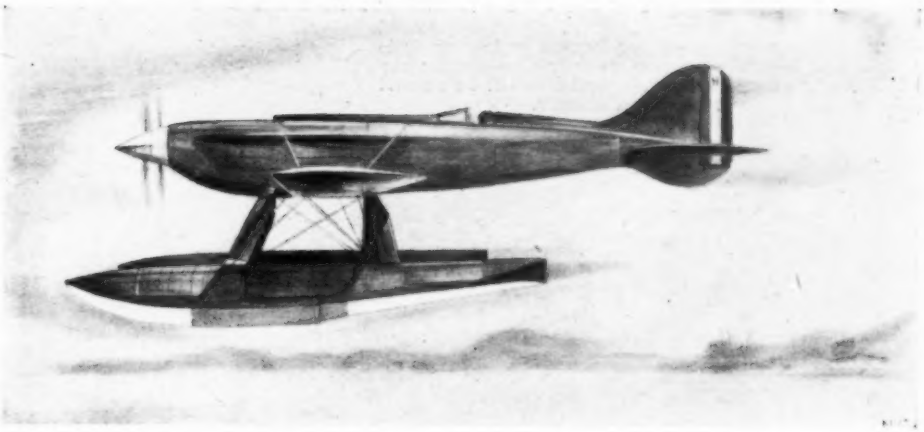
## WORLD'S AVIATION RECORDS

| Date. | Type of Record. | Country. | Pilot(s). | Aircraft and Engine. | Record. | Remarks. |
|---|---|---|---|---|---|---|
| Oct. 23, 1934... | Max. speed ... | Italy ... | Francesco Agello ... | Macchi-Castoldi 3,100 h.p. Fiat | { 440.681 m.p.h. { 709.209 km. hr. | 3 kilometre course Class C.2 |
| Sept 13, 1935 | Max. speed ... | U.S.A. ... | Howard Hughes ... | Hughes' Special Pratt and Whitney | { 352.388 m.p.h. { 567.115 km. hr. | Class C. |
| Nov. 11, 1935 | Altitude ... ... | U.S.A. ... | Anderson and Stevens | U.S. Army balloon | { 72,394.9 ft. { 22,066 m. | Class A. Eighth Category |
| Sept. 28 1936 | Altitude ... ... | G.B. ... ... | Sqd. Ldr. F. R. D. Swain. | Bristol 138 Pegasus P.E.VI.S. | { 19,967 ft. { 15,230 m. | Class C. |
| an 29, 1935 | Altitude ... ... | U.S.A. ... | Harry Richman ... | Sikorsky S.39 Pratt and Whitney | { 18,641.7 ft. { 5,682 m. | Amphibian Class C.3 |
| Aug. 5, 6, 7, 1935 | Airline distance ... | France ... | Codos and Rossi .. | Blériot-Zappata 110 Hispano-Suiza | { 5,657.387 miles { 9,104.700 km. | Class C. |
| March 23–26, 1932 | Closed circuit distance. | France ... | Rossi and Bossoutrot | Blériot-Zappata 110 Hispano-Suiza | { 6,587.441 miles { 10,601.580 km. | Class C. |
| Aug. 30 1936 | Airline distance ... | Czechoslovakia | Capt. Polma and Lt. Zelenv. | Praga Baby Praga (56 h.p.) | { 1,045 miles { 1,680 km. | Class C. Third Category |
| June 23, 1936 | Altitude ... ... | France ... | Mlle. Maryse Hilz ... | Potez 50 Gnôme-Rhône | { 16,475 ft. { 11,300 m. | Feminine Record, Class C. |
| Aug. 24, 25, 1932 | Airline distance ... | U.S.A. ... | Miss Amelia Earhart | Lockheed Vega Pratt and Whitney | { 2,447.728 miles { 3,939.245 km. | Feminine Record, Class C. |
| Aug. 11, 1934 | Max. speed ... | France ... | Mlle. Helene Boucher | Caudron C.450 Renault | { 276.527 m.p.h. { 445.028 km. hr. | Feminine Record, Class C. |
| Oct. 10, 1930... | Airline distance ... | Italy ... ... | Marinello Nelli ... | Ascanio Fiat A.50 | { 3,538.706 ft. { 1,078.60 m. | Helicopter, Class G. |
| Oct. 13, 1930... | Altitude ... ... | France ... | Maurice Claisse .. | Bréguet Hispano-Suiza | { 518.1 ft. { 158 m. | Helicopter, Class G. |
| Feb. 17, 1934 | Altitude ... ... | Germany ... | Heinrich Dittmar ... | D-Condor | { 14,189.6 ft. { 4,325 m. | Glider, Class D. |
| July 29, 1935 | Airline distance ... | Germany ... | Rudolf Oeltzschner | D-Leuna | { 313.295 miles { 504.200 km. | Glider, Class D. |

FÉDÉRATION AÉRONAUTIQUE INTERNATIONALE official records are divided into classes and the classes are subdivided into categories and sections. Class A is for balloons; B for airships; C for aeroplanes; D for gliders; E for autogiros; and G for helicopters. Records set up by women are separated under the heading "Feminine Records." Aeroplane Class C records can be made for (a) Distance, closed circuit. (b) Distance, airline. (c) Altitude. (d) Maximum speed. (e) Speed for 100, 1,000, 2,000, 5,000 and 10,000 km. Any of these records may be set up in one of the sections for aeroplanes with a pay-load of 500, 1,000, 2,000, 5,000 and 10,000 kg. (There is also a record for the greatest pay-load carried to an altitude of 2,000 metres.)

Class C correctly indicates aeroplanes weighing more than 500 kg. empty; Class C, first category, is for multi-seaters weighing empty between 280 and 500 kg.; Class C, second category, is for single-seaters between 200 and 450 kg.; Class C, third category, is for multi-seaters less than 280 kg.; and Class C, fourth category, for single-seaters less than 200 kg.

Class C2 represents seaplanes, and it is subdivided as above but for a small difference in weights for categories. The same records are recognised.



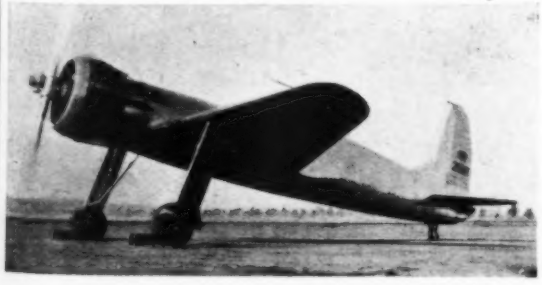
An impression of the Italian Macchi-Castoldi seaplane with twin Fiat engine of 3,100 h.p. The record of 440.68 m.p.h. it set up in 1934 has not since been challenged.

Flights from England to South Africa, and the return trip, have attracted many aspirants—and not so many in the case of the Schlesinger race. It will be recalled that the winners of that contest, C. W. A. Scott and Giles Guthrie, flying a Percival Vega Gull, set up the record time of 52 hr. 56 min. Capt. Halse, on a Mew Gull who led for most of the race, was unfortunate to crash on landing at Salisbury after having flown 5,200 miles in only 35 hours. The two-way solo record of 7 days, 22½ hours is held by Mrs. Amy Mollison; some three weeks ago the Fédération Aéronautique Internationale officially recognised her flight to the Cape in 78 hr. 28min. as a capital-to-capital record.

Until Wednesday, December 30, Miss Jean Batten held the South Atlantic record on her Gipsy Six Gull, the time being 13 hr. 15 min., but, as reported in *Flight* this week, this time has been lowered by over one hour by Mlle. Maryse Bastié, flying a French Caudron Simoun with Renault engine. The first solo crossing, which is about 1,900 miles, was made by Bert Hinkler, in 1931, in 22 hours on a Puss Moth. This pilot, on another occasion, made a very creditable 800-mile flight in an Avro Avian baby with a 35 h.p. Green engine. Mlle. Bastié also holds the straight-line distance record for light aeroplanes, second category; she flew a Klemm monoplane with 40 h.p. Salmson engine 1,849 miles.

As already stated, records other than the long-distance type are confined more to the specialists and test pilots. After winning the Schneider trophy race for three consecutive years, Great Britain left the field, in 1931, as owner of the trophy and holder of the world's speed record at 407.5 m.p.h. The aircraft was the Vickers Supermarine S.6.B, powered with Rolls-Royce 2,300 h.p. R engine. The pilot was Flt.-Lt. G. H. Stainforth. Three years later the record was raised to 440.68 m.p.h. by Francesco Agello, flying a special Macchi-Castoldi with 3,100 h.p. twin Fiat engine. The landplane record was set up in September, 1935, by Howard Hughes in a special monoplane with 1,000 h.p. Pratt and Whitney Twin Wasp Junior engine. His speed was 352.388 m.p.h.

For some time the world's altitude record of 47,352 ft. stood to the credit of an Italian Caproni aeroplane with a special Bristol Pegasus engine. Early in 1936 this was broken by Georges Détré on a modified Potez 50 with 900 h.p. Gnôme-Rhône 14 Kdrs. engine, the new figure being 48,674 ft. Lately Détré's record, too, has fallen to Sqn.-Ldr. Swain on a Bristol 138 monoplane with Pegasus P.E.VI.S engine. The height reached was 49,967 ft.



The Howard Hughes' racing aircraft. Redesigned wings and a twin Wasp engine are now being fitted for a further record attempt.

## *By the Fair Sex*

Until June 23 of last year the feminine altitude record of 28,743 ft. was held, on a Caproni with Bristol Pegasus engine, by the Marquise Carina Negrone, who also holds the seaplane altitude record. The record now stands in the name of Mlle. Maryse Hilz, of France, at 46,475 ft. The aircraft used was a Potez with Gnôme-Rhône engine.

Several other feminine records have been registered besides those for the recognised long-distance routes as covered by Miss Jean Batten and Mrs. Amy Mollison. The longest airline distance flown is by Amelia Earhart (Mrs. Putnam), who flew a Lockheed Vega with 480 h.p. Wasp engine 2,448 miles from Los Angeles to Newark.

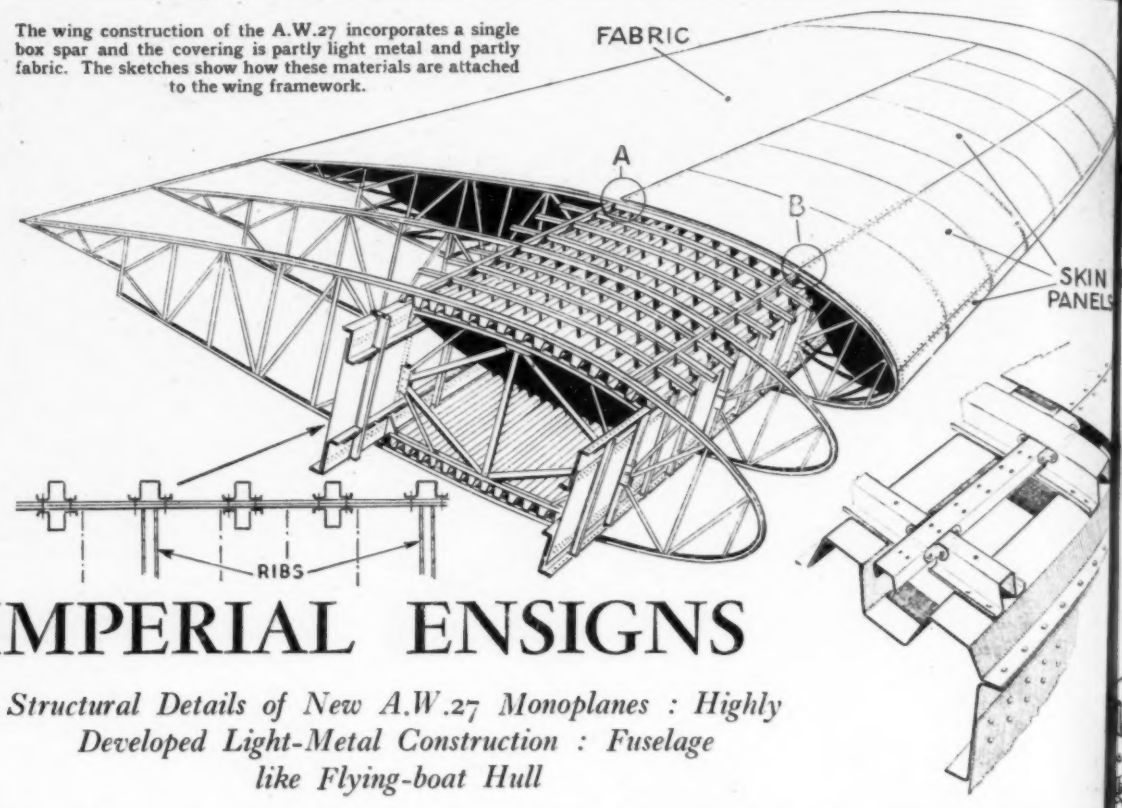
A Caudron C.450 was used to set up the maximum speed record of 276.5 m.p.h. The pilot was Mme. Helene Boucher, and she also holds the speed record over 100 and 1,000 kilometres.

There are some rather interesting flying records of more unusual types. On November 11, 1935, Capts. Anderson and Stevens, of the U.S. Army Corps, reached 72,394 ft. in a balloon; this is the greatest altitude attained by man. Germany is the most advanced nation in the gliding field, and holds long-distance and altitude above start records, these being 313.3 miles and 14,189.6 ft. respectively. Italy holds the helicopter distance record at 353.7 ft., but lately Maurice Claisse has made several promising flights, on the Bréguet-Dorand helicopter, with Hispano-Suiza engine. These flights were described in *Flight* of December 10, and the altitude of 158 metres reached by the Bréguet is now an official record.

## *Getting Steam Up*

ABOUT 5,000 workpeople will find employment when an aeroplane components factory is completed at White Waltham, near Maidenhead. It is to be operated by Rootes Securities, Ltd., who, it will be remembered, operate the Humber-Hillman combine and are parties to the Air Ministry shadow scheme.

A site has been acquired adjacent to the De Havilland civil training school at White Waltham, and plans have already been deposited with the local authorities. Considerable opposition is being raised by local residents.




The wing construction of the A.W.27 incorporates a single box spar and the covering is partly light metal and partly fabric. The sketches show how these materials are attached to the wing framework.

# IMPERIAL ENSIGNS

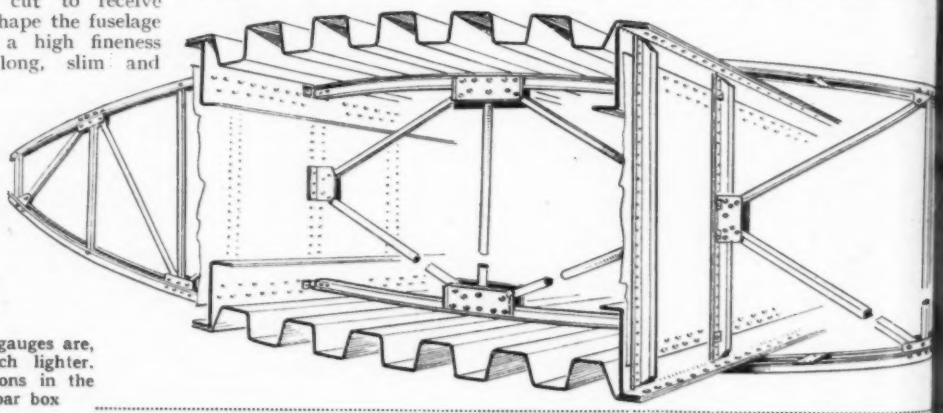
## *Structural Details of New A.W.27 Monoplanes : Highly Developed Light-Metal Construction : Fuselage like Flying-boat Hull*

WORK is progressing rapidly at Hamble on the new landplanes which Armstrong Whitworths are building for Imperial Airways, and the first of the twelve machines should be flying fairly soon. With a gross weight of approximately 20 tons, these machines will have a performance almost identical with that of the Empire boats, i.e., a top speed of about 200 m.p.h. and a cruising speed of something like 160 m.p.h.

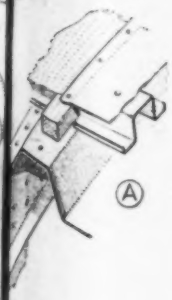
For use on the European routes, the *Ensign* class, as the A.W.27 will be called after the first machine, will carry 40 passengers, while on the Empire routes accommodation will be provided for 27 passengers by day and 20 by night.

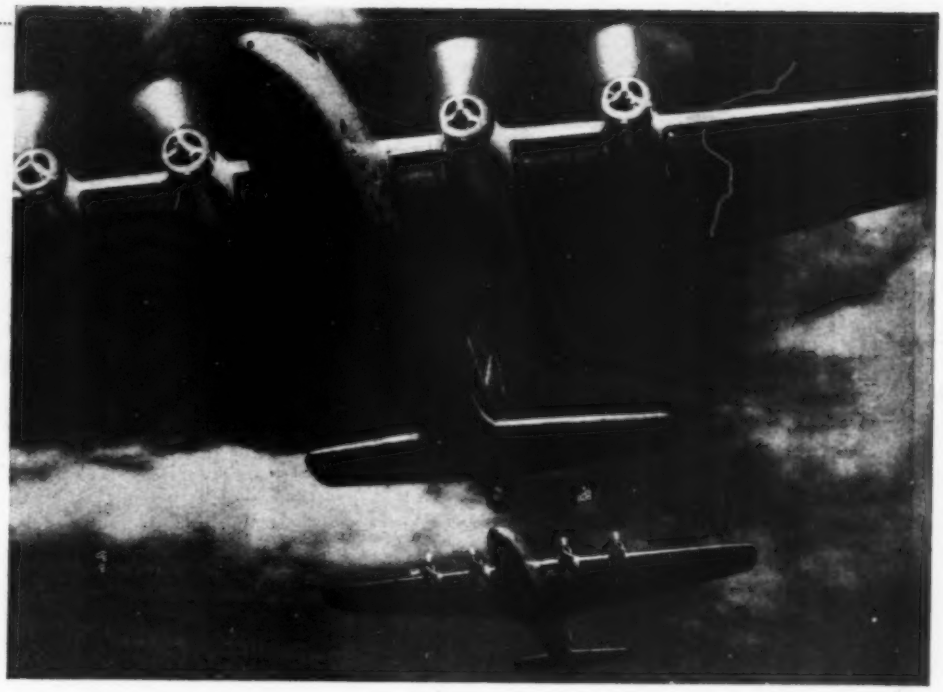
Some very interesting structural features are incorporated in the construction of the A.W.27. The fuselage is a stressed-skin shell, with the longitudinal stringers running through from end to end and joggled into the frames, which are cut to receive them. In external shape the fuselage is characterised by a high fineness ratio, being very long, slim and graceful in appearance. In the construction of the wing the Armstrong Whitworth designers have shown a great deal of originality, and although specific figures may not be published at present it can be said that the strength-weight ratio of the A.W. type of wing construction is very good. Fundamentally, it consists of a single large box spar of light-metal construction to which are attached the front and rear portions of the wing ribs. The wing construction forms, in fact, an intermediate stage between the stressed-skin multi-spar type and what Dr. Lachmann, in his recent paper, called the "concentrated flanges" type. It also affords an interesting comparison with the type of construction employed in the Short Empire boats.

Where Mr. Gouge employs extruded T-sections at the spar corners and ties them together with fork-ended tubes which form a girder, Mr. Lloyd uses Z-sections at

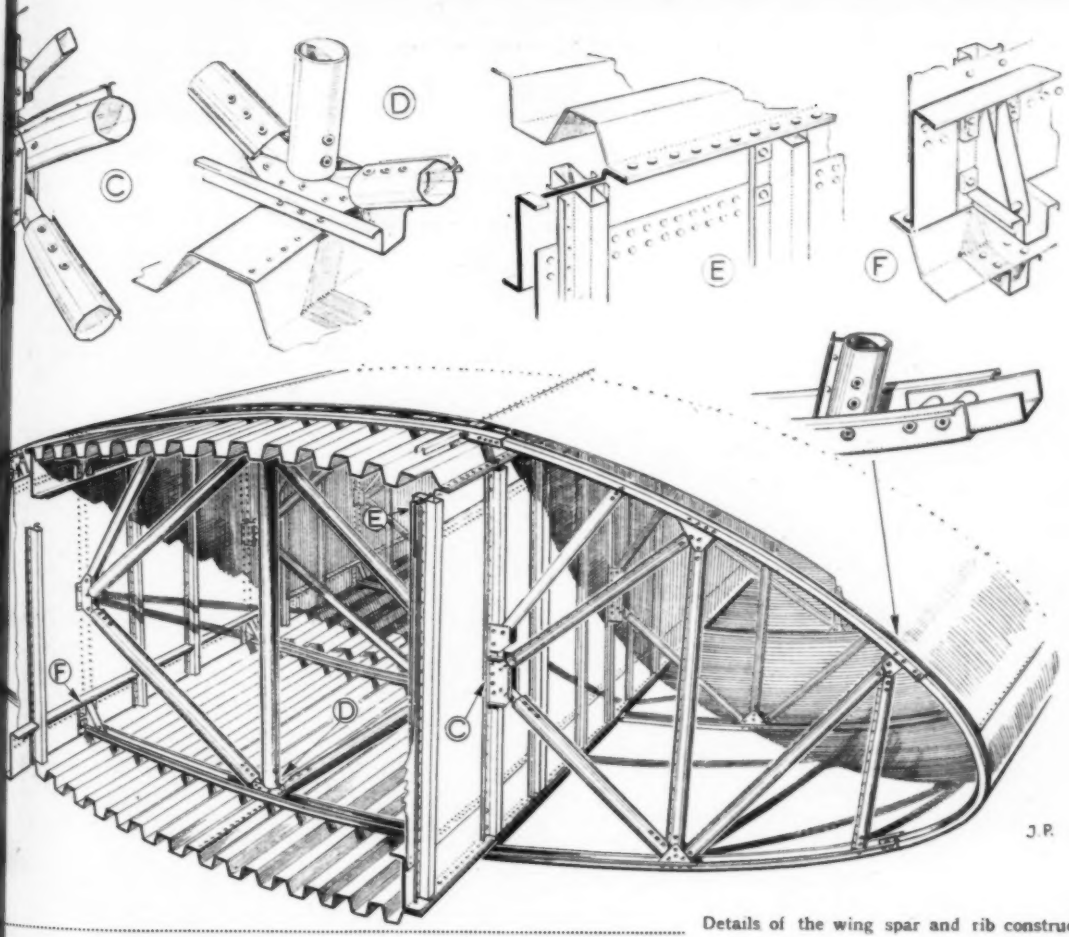


The construction of the tail follows the same general system as that used in the main wing, but the gauges are, of course, very much lighter. Note the "Z" sections in the corners of the spar box

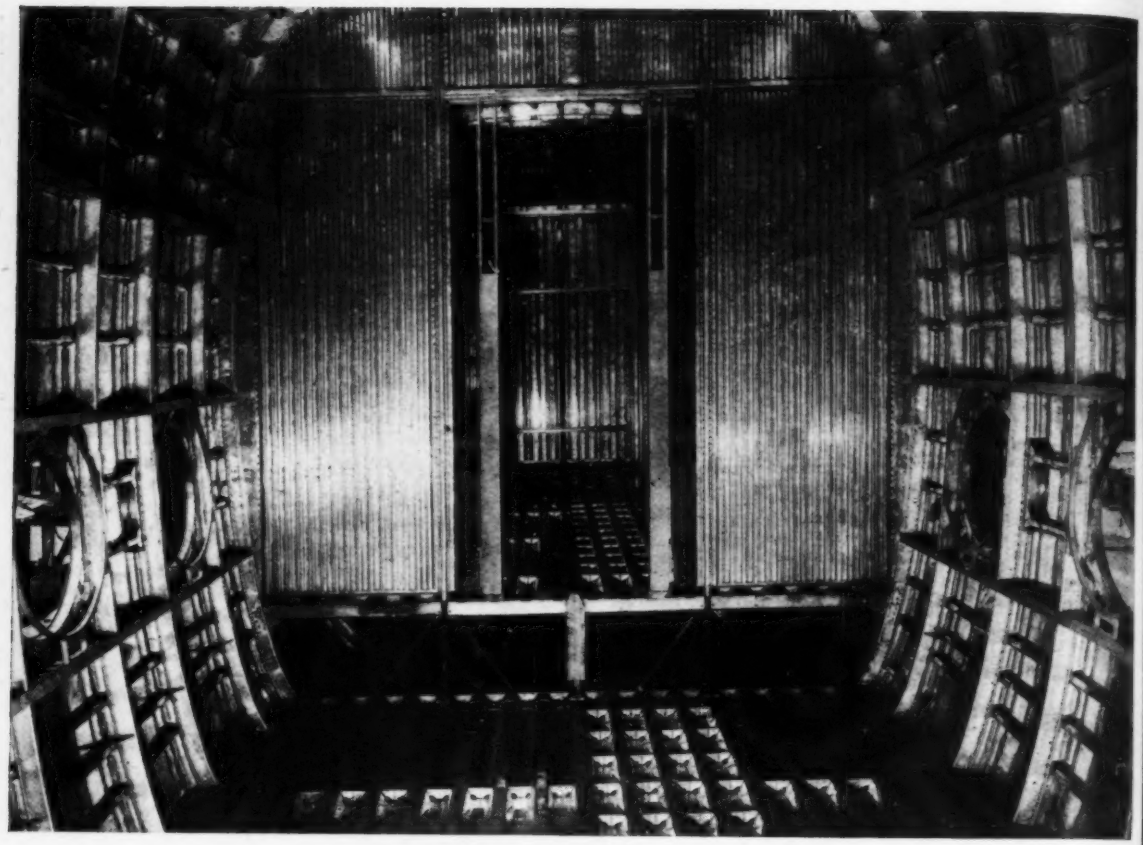


Weighing nearly 20 tons, the A.W.27 or *Ensign* class will carry 40 passengers on the European routes and up to 27 passengers on Empire routes.




Details of the wing spar and rib construction

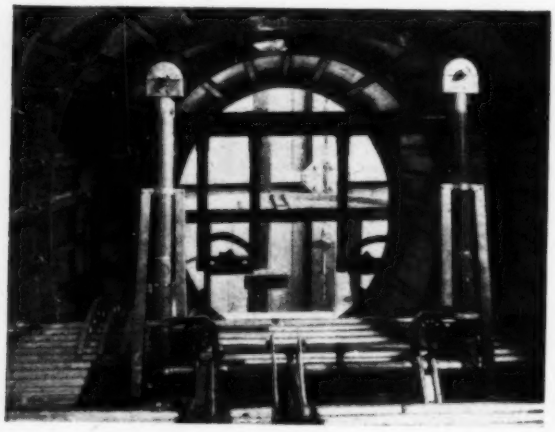


Inside the fuselage. The longitudinal stringers are continuous and are joggled into the frames. The floor beam supports take the form of girders of tubular construction.

the corners and connects them with light-metal panels of corrugated form. The rectangular-section box thus formed is stabilised by tubes forming diamond-shaped trusses inside the box, as shown in the sketches.

The resultant wing spar is not only a good beam for taking bending stresses, but the stabilised box is excellent for resisting torsion loads. It is assisted in this by the sheet metal covering over the front portion. The trailing edge portion of the wing, on the other hand, would in any case be rather too shallow to form an efficient structure member, and so Mr. Lloyd uses fabric covering over this portion, the method of attaching the edge of the fabric being shown in a sketch.

An examination of the sketches will reveal at once to the aircraft engineer the reason for Mr. Lloyd's use of Z-sections in the spar corners: the edges to be riveted are readily accessible and there are no awkward corners into which the dolly cannot be inserted.



(Left) The "Office": Note the two control columns, ready for their wheels, and the hanging rudder pedals. The tail-trimming wheel is seen in the centre, at floor level. (Right) A view inside the forward cabin, looking towards the pilots' cockpit.

# THE FOUR WINDS

## ITEMS OF INTEREST FROM ALL QUARTERS

TWO of the new D.H. Gipsy Major Series II engines are being installed in a D.H. Dragonfly.

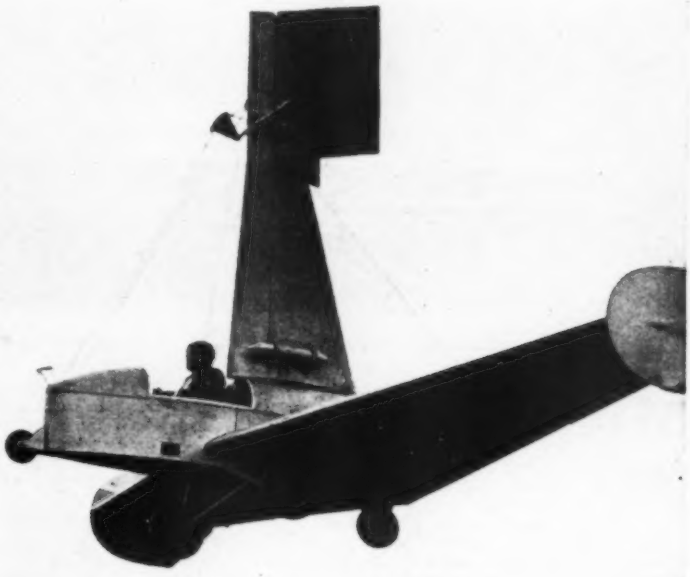
Machines of the U.S.A. Army Air Corps have been dropping "bombs" containing tree seeds on Hawaiian hillsides.

That only four of the seven Heyfords that participated in the ill-fated Aldergrove-Finningley flight were fitted with radio was stated at last Tuesday's inquest on the three victims.

According to our Australian contemporary *Aircraft*, the R.A.A.F. will be fortunate if it gets any of its Bristol Blenheims before next Christmas.

The North American O-47 observation monoplane (designed for similar work to our army co-operation machines) has a "belly" beneath the mid-wing containing transparent panels for the observer.

A series of three lectures on Cosmic Rays will be given by Professor P. M. S. Blackett, M.A., F.R.S., on Monday evenings, January 18 and 25, and February 1, at 8 p.m., at the Royal Society of Arts, John Street, Adelphi, London, W.C.2. Tickets may be obtained from the secretary of the Society.



**TAILS UP!**

**Successful performance has now been achieved at Toussus le Noble, France, with this startling aircraft, which was illustrated in *Flight* a year ago. It is the brain-child of M. Charles de Rouge.**

*Flight* regrets to record the death of Baron Henry d'Erlanger in an attempted forced landing in Italy.

Mr. David Llewellyn hopes to start his England-Cape-and-return flight any time now and to accomplish it in four days.

**CALSHOT REMINISCENCE:**

**The late Lady Houston being received by Sqn.-Ldr. (now Wing Commander) Orlebar at Calshot in 1931, when she visited the Schneider Trophy team. A note on her support of the Race appears on page 12.**

A seaplane version of the Heinkel He.51 single-seater fighter (750 h.p. B.M.W.) is in service with the German Air Force.

The date of the Brussels First International Aircraft Exhibition has now been definitely fixed as May 26-June 6, 1937. The organisers have appointed a British agent, from whom any required information is available. He is Mr. A. Thomson, 9, Albemarle Street, London, W.1. (Telephone: Regent 4147.)

Mr. F. Crocombe, chief designer of General Aircraft, Ltd., and Mr. L. Davies, ground engineer, the two members of the company's staff who were in the ill-fated Monospar Croydon which was stranded on Seringapatam Reef on its return journey from Australia, have been presented with inscribed silver cigarette cases by the directors of the company in appreciation of the gallant efforts they made in very difficult circumstances.

### *Twenty-five Years Ago*

*(From "Flight" of January 6, 1912.)*

"The painstaking but very energetic research that progresses at the Army Aircraft Factory, under the superintendence of Mr. Mervyn O'Gorman, has resulted in another experimental aeroplane taking the air. The machine—from what we are allowed to see of it at the polite distance of a spectator among the casual public that frequents the Plain on the 'off-chance'—is a large biplane with an absolutely silent engine."

# SOUTH ATLANTIC TIME LOWERED

## *French Woman Pilot Improves on Miss Batten's Record*

**Mlle. Bastié and a Caudron Simoun similar to that which she used on her successful South Atlantic attempt.**

MLLE. MARYSE BASTIÉ, the French airwoman, has lowered Jean Batten's record time for a South Atlantic crossing by 1hr. 10min. The existing record was 13hr. 15min. and the new time is 12hr. 5min. After announcing her intended flight as far back as last January, Mlle Bastié took off from Dakar in North Africa at 7.23 a.m. (G.M.T.) on Wednesday, December 30, and flew to Port Natal, Brazil, a distance of 1,700 miles.

The aeroplane, a four-seater cabin monoplane, is a Caudron Simoun lent by M. Cot, the French Air Minister. The Simoun is powered by a 220 h.p. Renault Bengali Six which gives it a maximum speed of 186 m.p.h. and a cruising speed of 167.5 m.p.h. The normal range is 560 miles, but in this case extra tanks increased the figure to 2,500 miles.

Mlle. Bastié is a well-known figure in French aviation and is the holder of long-distance and endurance records, for which she has been awarded the French Legion of Honour.

Another recent French success on a Caudron Simoun was the flight of M. André Japy from Le Bourget to Fukuoka in Japan, where, on the last stage of the journey, the aircraft was damaged in landing. The average speed for the whole distance of over 9,000 miles was 128 m.p.h.

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### *Lady Houston*

PROBABLY those who accuse the late Lady Houston of carrying patriotism to the point of fanaticism are not far from the truth, but whatever her errors she will be remembered as a great benefactor to aviation. Her munificence made possible two great aeronautical achievements: when, in 1931, the Socialist Government, on grounds of economy, decided not to defend the Schneider Trophy, she guaranteed £100,000 to defray the cost, and later gave her bounteous blessing to the Mount Everest Expedition on which two Westland biplanes put up some epic performances.

The following statement, made on September 3, 1931, exemplifies her faith in British pilots and machines: "To show that I am not downhearted if our airmen win by default and a walk-over, I challenge the airmen of the whole world to another race, to be called the Houston Trophy, and besides giving the trophy I will award the winner £1,000 in money."

In 1932 she offered the Chancellor of the Exchequer, Mr. Chamberlain, £200,000 toward the £5,000,000 which she considered necessary to supplement provisions made for the Navy, Army and R.A.F. The offer had to be tactfully refused.

### *Death of Mr. Arthur Wormald*

*FLIGHT* regrets to record the death of Mr. Arthur Wormald, O.B.E., director and former general works manager of Rolls-Royce, Ltd., Derby.

Until ill health intervened during the last few months of his long association with the firm, Mr. Wormald was a familiar figure in machine shops, erecting bay and all other departments of the works at Derby. One who knew him recalls how just that little extra effort and concentration marked the approach of his slight figure to any department—this not induced by fear, but inspired by a real desire to please a master for whom everyone of the many thousands in his employ felt a great affection.

If a man was seen to be approaching a job in the wrong way there was never a hard word spoken or a voice raised. Mr. Wormald, speaking as a friend and equal, would himself offer to show the man how the job should be done. Finally, every man, whatever his position, knew that if any dispute arose he could be sure of a fair hearing and an unbiased verdict in Mr. Wormald's office.

### *The Airports Exhibition and Conference*

EXHIBITORS at the Airports Exhibition, now only a fortnight distant, are likely to number about fifty.

This year the Exhibition, which is again being held in conjunction with the annual conference of the Aerodrome Owners' Association moves to the Central Hall, Westminster, S.W.1. Confusion appears to have arisen in some people's minds between this event and the "Airports and Airways" exhibition, to be organised by the Royal Institute of British Architects, though the latter will not be inaugurated until February 19, and will subsequently go on tour for the benefit of local authorities.

It is now possible to disclose details of the Aerodrome Owners Association programme. The proceedings, which cover three days, include a business meeting for members of the association, the official dinner, demonstrations by exhibitors, meeting and discussion, and a visit to lunch at Hatfield Aerodrome. Tickets covering all but the business meeting can be obtained from the Association, 32, Savile Row, London, W.1, price 35s. The full time-table is as follows:—

*Wednesday, January 20.*

11 a.m. Official opening of Conference and Exhibition.

2.30 p.m. Private business meeting for Association members.

8 p.m. Official dinner.

*Thursday, January 21.*

10.15 a.m. Demonstration of blind landing system.

2.30 p.m. Consideration and general discussion of important matters interesting aerodrome operators and owners. Subjects, some of which will arise out of the Association's annual report, to be announced later.

*Friday, January 22.*

10 a.m.—Start of Hatfield visit—lunch to follow. (Exhibition open all day on Friday.)

### *C. of A. Overhaul for "Lamps"*

CAPT. A. G. LAMPLUGH, of insurance fame, remarks that he is "being parked in a nursing home for the next fortnight or three weeks on the score of alleged strain of the heart."

He refuses, however, to lose touch with his office, through which he will be available if wanted.

# MODERN "SIX"

## *The De Havilland Gipsy Six Series II : Extensive Refinements : The "1,000" Type V.P. Airscrew*

PRIVATE owners and operators of small and medium-sized commercial types are offered, in the De Havilland Series II Gipsy Six engine, not only increased power output for continuous operation but equipment enabling them to take advantage of devices reserved hitherto for high-powered units.

Of these devices the most important is the "1,000" type De Havilland hydraulically controlled two-position variable-pitch airscrew, an even more efficient alternative to which—the D.H. constant-speed airscrew—will be available in the immediate future.

Externally there is little to distinguish the Series II engine from its predecessor (or, more strictly, older brother, for the Series I model is still in large-scale production and is likely to continue to find extensive application), but close examination of a stripped engine, such as was afforded *Flight* last week, reveals alterations to a number of features.

The most notable advance affecting the engine itself is the adoption of 77 octane fuel. Although D.T.D.224 gives this knock rating without tetraethyl lead the new engine has been made suitable for leaded fuels because in certain parts of the world "D.T.D." is not available.

**The complete "six" : A view of the Series II Gipsy Six showing the "1,000" type D.H. variable-pitch airscrew, air scoop and oil pipe for the operation of the airscrew.** (*Flight* photograph.)

### *Anti-Lead*

As lead is liable to attack valve seatings, valves, sparking plugs and cylinder heads it was necessary during development work to take steps to resist this erosion. Accordingly, aluminium alloy castings were used for the heads having inserted seats of high-expansion steel. Tests proved that when using exhaust valves with Stellited seatings against this type of valve-seat insert any harm from lead deposits was avoided. Lead deposits on the threads of sparking plugs tend to damage the adaptor threads when the plugs are removed for cleaning, so a special bottom-seated adaptor has been incorporated to obviate this danger.

With these refinements the Series II engine will withstand fuels with very high lead content; in fact, the two 50-hour "civil approval" tests were run with entirely satisfactory results on a very low grade fuel brought up to 77 octane rating by the addition of an abnormal quantity of lead.

Other innovations are forged dome-topped pistons giving a compression ratio of 6 : 1, 14 mm. plugs (instead of 12 mm.), a new type of cast elektron rocker box, the base of which is cast integral with the cylinder head, revised valve rocker gear, the arms and bearings being designed for stronger valve springs, increased fin area on the cylinder heads, and redesigned exhaust ports giving a better manifold line.

When a vacuum pump for driving blind-flying instruments and/or a gear box for driving a constant-speed airscrew governor is required a drive is taken from the magneto driving gear in the centre of the top cover *via* an aluminium cover tube between the magnetos and so to an extension at the rear of the top cover, which is provided with a facing to take these two accessories.

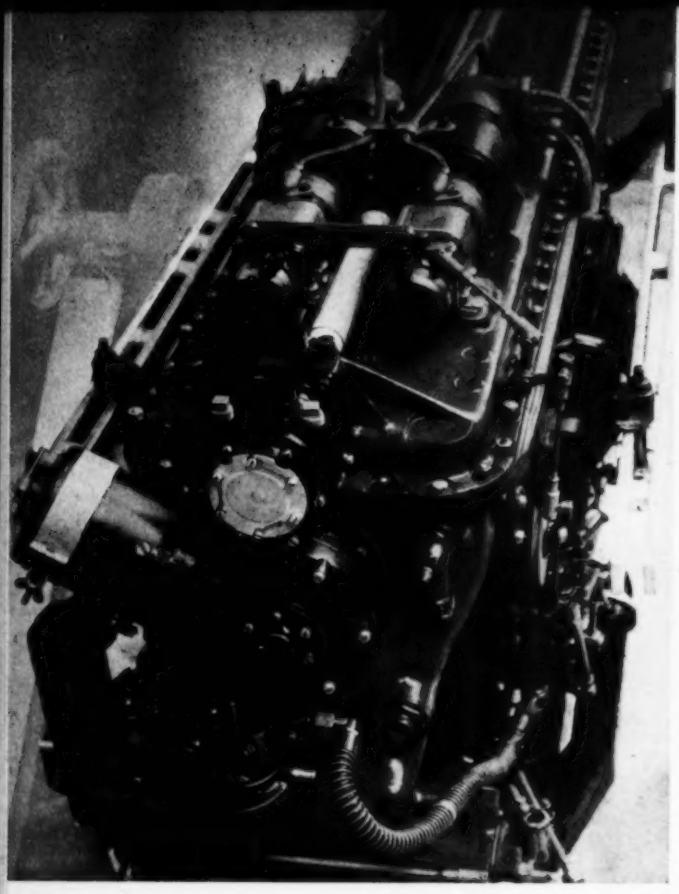
The crankshaft has been designed to take variable- or fixed-pitch airscrews and accommodation is made for an appropriate oil-pressure increasing valve and hand control for the two-position airscrew.

An ignition system screening is available, and a variety of optional extra equipment may be specified, including tappet-rod casing sleeves for use on engines operating in sand-laden atmospheres.

### *Testing*

Concurrently with the development of the engine it was necessary to evolve a suitable variable-pitch airscrew, and a great deal of testing was subsequently required because little or no data was available on the behaviour of a six-in-line engine/v.p. airscrew combination.

The engine was run in a test-bed for about 404 hours, using a Heenan and Froude brake to absorb the power, and for about 600 hours it was connected with a v.p. airscrew and mounted in a wire-suspended cradle by means of the standard shock-absorbing air frame installation, giving conditions of airflow and rigidity closely resembling those experienced in actual flight. Two 100-hour tests were run at full throttle with the airscrew pitch set to



**Above: The arrangement of accessories on top and rear covers of the new engine and (right) the latest design of valve gear.** (*Flight* photograph.)

absorb the power developed at 2,400 r.p.m. During a further period frequent changes were made in the pitch setting of the airscrew. Further experiments were conducted with the engine driving, in turn, a wooden airscrew, a Fairey Reed and a two-position variable-pitch airscrew, torsiographs being taken to determine whether it was free from any serious period of torsional vibration.

Some quite astounding results were obtained from a supercharged Gipsy Six II, regarded, for the purpose of experiments, as one half of a "Twelve." It was run for twenty hours at 2,600 r.p.m., the output being 309 h.p. with 4 lb. boost. At even higher r.p.m. and approximately the same boost the power was 325 h.p.

There appears to be current some confusion about the exact advantages of the new engine over the Series I. Its virtues might be summarised in that it has been planned to operate at a higher continuous power output for level cruising and delivers considerably increased power at a higher crankshaft speed for take-off and climb. This extra efficiency has been obtained at the expense of a very slight increase in weight.

It may be recalled that when De Havillands secured from the American Hamilton concern the licence to manufacture their hydraulically controllable airscrews no units had been produced for engines of under about 400 h.p. It was felt that the high cost of the development work which would be entailed to keep the size and weight of the operating mechanism within the desired limits for an engine of 130-200 h.p. would be more than justified.

One of the greatest problems to be faced was that of cooling the engine. It was necessary to make the pitch-changing mechanism particularly compact and to preserve the aerofoil section of the blades as far inward to the hub as possible to ensure satisfactory cooling when climbing and taxi-ing.

All requirements were successfully met, and the result was the "1,000" size airscrew weighing about 70 lb. and having a pitch range of 9 deg. Development work is proceeding with a new model on similar lines, but having a pitch range of 14 deg. When the first batch of Gipsy Six IIs and "1,000" size airscrews was tried out in Percival

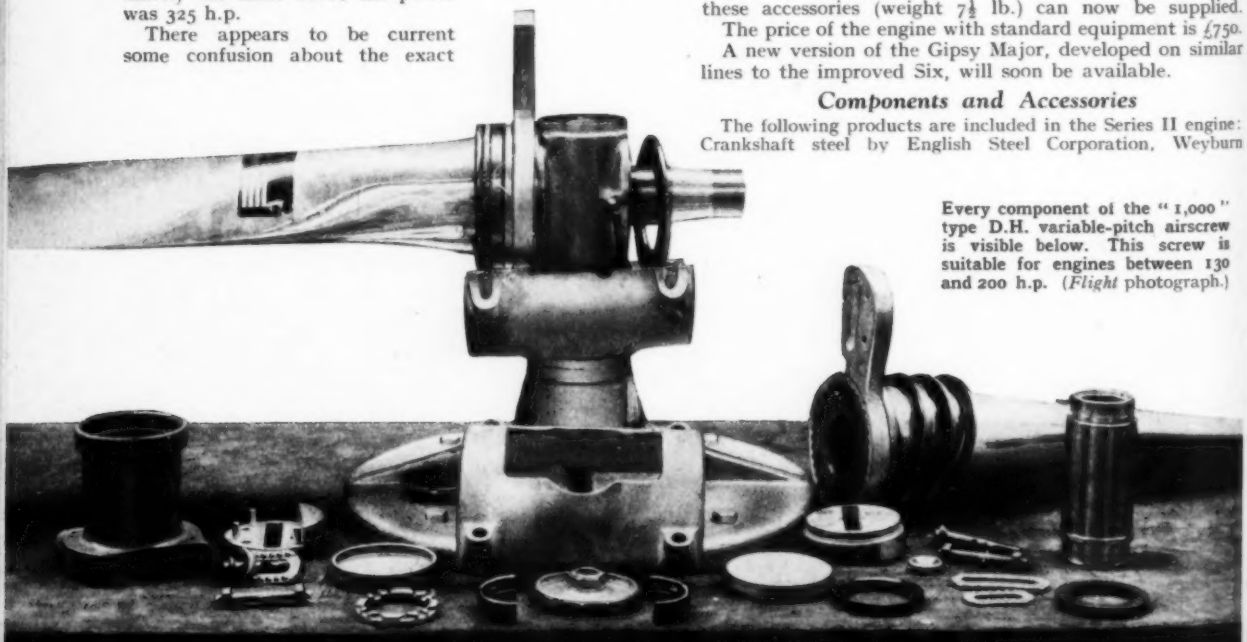
machines in the Schlesinger race (in which the combination functioned flawlessly) spinners were not available, but these accessories (weight 7½ lb.) can now be supplied.

The price of the engine with standard equipment is £750.

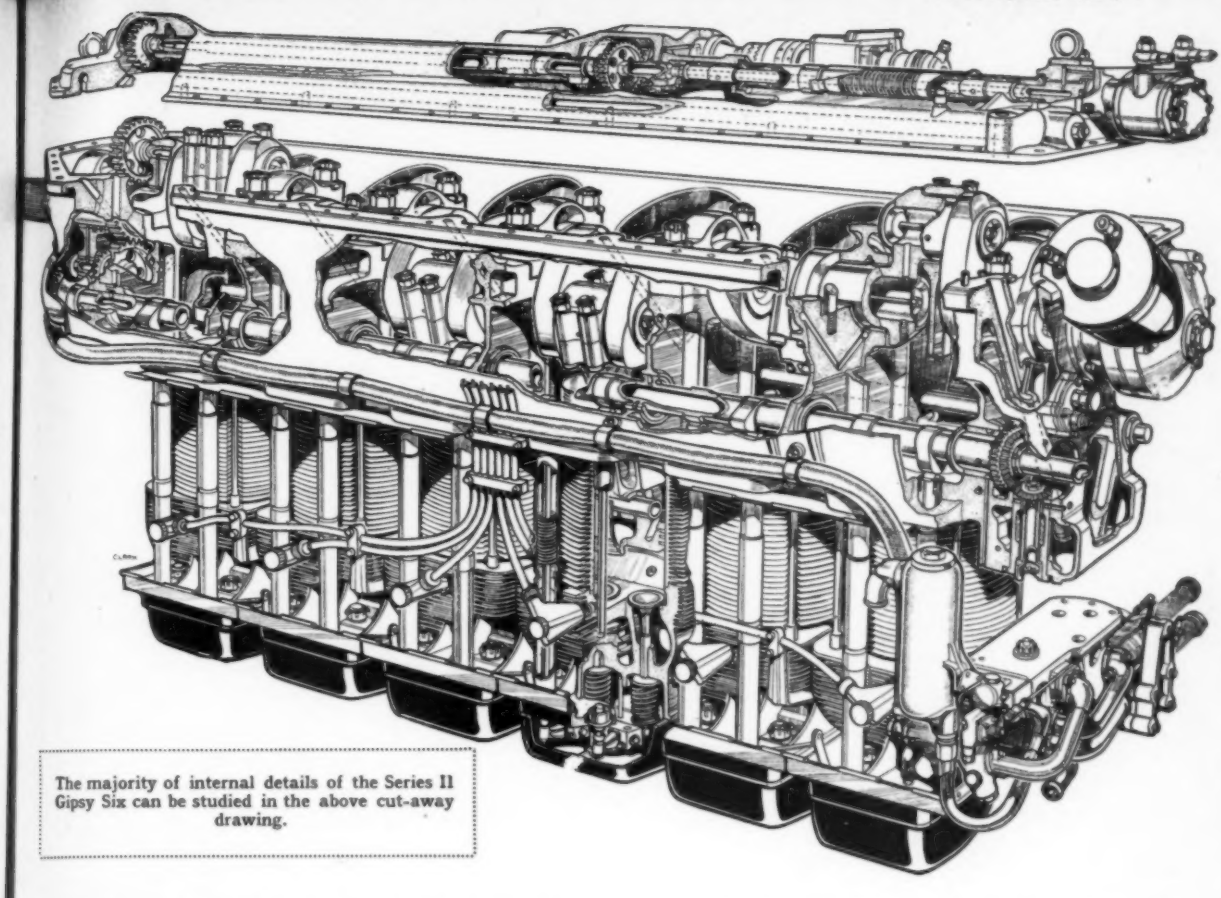
A new version of the Gipsy Major, developed on similar lines to the improved Six, will soon be available.

### *Components and Accessories*

The following products are included in the Series II engine: Crankshaft steel by English Steel Corporation, Weyburn



**Every component of the "1,000" type D.H. variable-pitch airscrew is visible below. This screw is suitable for engines between 130 and 200 h.p.** (*Flight* photograph.)



The majority of internal details of the Series II Gipsy Six can be studied in the above cut-away drawing.

Camshaft; piston forgings and connecting rods by High Duty Alloys and Sterling Metals; K.L.G. bottom seating sparking plugs; Elektron castings for crank case and rocker boxes by Sterling Metals; aluminium cylinder heads by Mills of Birmingham; white metal bearings (plain) by Hoyt and (steel-backed) by the Eyre Smelting Co.; Wellworthy piston rings; Salter's valve springs; B.T.H. magnetos; Simms' flexible couplings; high-tension cable by British Insulated Cables; B.T.H. screened cables; Chater-Lea H.T. terminals; Amal petrol pump and flame trap; Auto-Klean filter; Rotax starter and vacuum pump gaskets by Hall and Hall and Cooper's Mechanical Jointing; Robertson's hose clips; oil-resisting rubber by the Northern Rubber Co., Dermatine Co. and Lyne Hancock; liquid jointing material by Held Glue and Compounds, Ltd. and Kenilworth Manufacturing Co.; and engine paint by Pinchin Johnson.

# THE WAR to COME?

By A. J. RICHARDSON*

SEA power is as dead as the dodo, and land forces nothing but police. The air is all. Air power now rules the world—although the world is not yet wholly awake to that fact, fortunately for us in our comical little island in the North Sea.

In the days that are gone for ever, the strategical position of that island, an arc subtending the sea termini of the great water and land routes into the Eurasian Continent, won for us the sea supremacy, military and commercial, of the world and, with that, one quarter of the world's land surface. Already a younger nation has defied us, a nation quicker to recognise that power is now in the air and the ether.

In a book, published in 1926, I wrote, "To-day it is air power that is both sea and land dominion." I had been dealing with the Roman-Carthaginian struggle and had quoted Gibbon's "Sea power always wins land dominion." Let us consider the strategy of a war between two Great Powers with a common frontier.

The spies have done their work, but, doubtless, many of them remain at their posts. "He (Louis) is preceded by an army of cooks. I (Frederick) by one of spies." The clumsy foreigner whose trial is recorded in the Press with much pomp and circumstance is not the spy to be feared. "Every man has his price, and I have only known one woman who would not take money—and she would take diamonds." The spy that is worth money—or diamonds—has no need for a camera.

All is ready. The eagles swoop. On what? In bygone days it would have been on the fleet in being or on the army in the field. That principle still holds. The objective will be the enemy air squadrons. Destroy those or destroy the morale of their pilots and the rest is but police work, the occupation by sea or land forces of such points in enemy territory as may give the invader a grip on elements more tangible than air.

Air battles will decide air supremacy, and war is again a knightly, chivalrous undertaking. No more of the dirt and squalor of the trenches; never again will one step from the dug-out to face a corpse that a heavy shell has just hoisted out of the earth and into a sitting position. The circle is round once more to the era of the paladins. Will it see a Charlemagne? Or will it witness air marshals safely domiciled a hundred miles beyond all danger and their various subordinates imitating them as nearly as they can? In the last great war it was commonly said that honours and emoluments varied directly with distance from danger. Will it be so in the next? Always it has been easy for commanders who dislike personal risks to demonstrate the necessity of avoiding them. Wireless communication now removes one of the so-called necessities—if the commander has courage, physical, animal courage, the courage of a Charlemagne, of a Nelson.

[*Mr. Richardson has some unique qualifications for writing this trenchant and controversial little article. He fought as commander of a mounted infantry company fifty years ago. To-day, at the age of seventy-five, he is an enthusiastic private pilot.*—ED.]

# HERE and THERE

*News of New Accessories, Components and Developments in the Aviation World*

## The Bristol Dual Fuel Pump

THE low-wing monoplane type of aircraft does not conveniently allow the installation of gravity feed fuel tanks, which provide for the official half-hour flying required in the event of fuel pump failure.

The dual fuel pump produced by the Bristol Aeroplane Co., Ltd., has been designed to ensure immunity from engine stoppage due to this cause. It is extremely compact, weighs only 3½ lb. (1.9 kg.), and has passed two official 100-hour type tests, while over one thousand hours' development running are stated to have been completed at speeds up to 2,600 r.p.m.

The Bristol pump is dual in every respect. Each pump shaft is driven through gearing from a single drive connection, and shear couplings are provided in each, so that should one pump seize or fail, the drive is automatically disconnected, and the other sound pump unit will continue to function without hindrance, by virtue of an isolating valve which automatically segregates the faulty unit.

The shafts and gears are lubricated under pressure, the rotors are of the four-vane type, and each pump is capable of supplying more than double the quantity of fuel required for normal maximum consumption. The unit is positively self-priming, and will suck a 12-foot (3.050 metres) head of fuel in 20 seconds at 500 r.p.m. This ensures that engines will be started upon the residual fuel in the carburetter float chamber, with the assurance that normal feed will be established before this supply is exhausted.

Provision is made on each unit of the pump for the attachment of a testing gauge, by means of which the effective operation of each may be quickly ascertained before flight.

**USEFUL LUXURY: A car radio set has been fitted to a private owner's D.H. Hornet Moth by the Philco concern. Apart from its entertainment value, this equipment should be useful now that regular meteorological broadcasts are made during the day, and this photograph shows how neatly it has been installed. The Hornet is owned by Mr. Derek Schreiber. Results appear to have been satisfactory despite the lack of ignition screening.**

## See How They Run

AN unusual type of instrument, based on the stroboscope, and capable of measuring rotational speed, and vibrations and oscillations of reciprocating parts, has been placed on the market under the name of "Tele-Tachometer Stroboret, Type R."

**The Stroboret: The eye-piece can be seen at the back.**

The advantages of the instrument, which is simple to operate and easy to carry about, are that no contact with the machinery concerned is necessary, and a high degree of accuracy is obtained. Observations are made, according to the scale of speed, through one of five slits in the stroboscopic disc, adjusted by turning a central pin at the back of the instrument. The complete range of the instrument is between 300 and 12,500 r.p.m.

For a reading to be taken, a mark must first be made on the machinery near to the centre of rotation or oscillation. The movement is wound up by pressing the lever—visible in the photograph—with one finger of the hand holding the instrument. The reference mark on the machine is observed through the rotating disc which is controlled by the milled knob on the side of the instrument. When the mark has been adjusted to appear as a stationary single image, the speed is indicated by the pointer. If the figure be, for example, 6,000 r.p.m., the machine is running at 6,000 r.p.m., or a multiple of that number, i.e., 12,000 or 18,000. Should there be a doubt as to which number is the correct one, the user turns the knob back until a further reading position is obtained at, say, 4,000 on the dial, then $(6,000 \times 4,000)$ divided by $(6,000 - 4,000) = 12,000$ r.p.m.—the required speed of rotation.

An additional attribute of this Stroboret—which, incidentally, weighs 2lb.—is the immediate indication of the slightest irregularity in the running of a machine.

James Cochrane and Co., of 101, Leadenhall Street, London, E.C.3, are the agents for this device.

## Training in Portugal

A NEW civilian flying school recently started operations near Lisbon. The promoter of the school is Engineer Manuel Bramao, himself a flying enthusiast, and agent for the Taylor Cub in Portugal.

Hitherto, very few facilities have existed in Portugal for flying training, and the number of Portuguese civil pilots cannot be more than about thirty. Genuine private owners number about five or six. In less than five weeks of the inception, of the sixteen pupils taking the first course, seven went solo, the average time required to reach this stage being about 4½ hours. The cost of taking out a ticket is rather low—about £22 15s.—so it can easily be understood that there is no profit in the undertaking. No subsidy is given by the Portuguese Government for aviation in any form; this has to "fly by itself," as the saying goes.

The machine used is a Taylor Cub fitted with a Continental 37h.p. engine, and a second machine has been ordered.

The School functions at the military aerodrome at Cintra, where is stationed, also, the School of the Aero Club of Portugal. The Prime Minister of Portugal, Dr. Oliveira Salazar, is very interested in the school, and quite possibly he may be induced, in the course of time, to give it some support as part of a scheme of national defence.

# *Topics of the Day*

## *Back to the Beginning*

SOME time ago I dived firmly off at the deep end in the matter of aeroplane design in general—asking, in fact, whether we were really on the right track.

Those remarks were not universally popular, but since that time I have received some vocal and epistolatory support from quite surprising quarters. Not unnaturally, transport pilots are the most outspoken critics of the present-day idea of a flying machine; they fly so often in conditions which, at the take-off, approach and landing speed of the modern aeroplane, often make a minor navigational or visual error an affair of fatal consequences.

The fact is, of course, that the majority of designers have been "single-tracking" since pre-war days, and in no item is this conservatism so noticeable as in the case of control operation. In the very early days of flying, various people had different ideas about control systems—and some of them must have been very different indeed. One thing appeared to be certain, however: It was not possible for a pilot to manage everything with his hands alone. Hence the rudder-bar, which still causes more trouble to the learner than all the other controls put together. Then Mr. R. E. Pelterie "invented" the simple central column, for lateral and fore-and-aft control, to go with the rudder-bar, and aeroplanes have had these same controls, with minor modifications, for the last twenty-eight years.

## *Thinking Again*

IT may be that this system is right, though fifty thousand people have been known to be wrong before now, and it does not seem likely that a system developed for the control of 1909-10 machines will be equally right for modern machines with quite different characteristics. Much as I should hate to have to learn to fly all over again, the feet should *not* be asked (boots and all) to operate anything so dangerously sensitive as the rudder.

We may eventually discover better methods of changing the attitude of a machine—ailerons, elevators and rudders have been with us as a worry for a similar length of time—but, until we do, there appears to be only one alternative to the foot-operated rudder.

This is the wheel at the top of the normal column. Such a control system was specially fitted many years ago to a Gipsy Moth, and is fitted now to the Hordern-Richmond monoplane. Though my progress while flying the latter was somewhat erratic, I go so far as to claim that this system is more logical, more easily handled by the novice, and more natural in straightforward flying. Anyone who doubts it should try this machine—not for ten minutes, but for half an hour or more.

The only weakness in the logic concerns the fact that the rudder is only an incidental and uncomfortable means of making a turn. In one or two machines, notably the Hornet Moth, it is not even necessary to use the rudder at all for this purpose. If the rudder wheel is small, however, it does not feel like, and is not consequently used as, a "steering wheel," but simply as an auxiliary device for counteracting aileron drag, for holding up the nose in a steep turn and for side-slipping.

When someone produces a machine which will turn accurately and quickly on some form of aileron-cum-spoiler, and which has infinitely variable quick-action flaps of great power (making the ridiculous sideslip a thing of the past), we may be able to do without a rudder and be satisfied with a mere directional-trimming tab.

## *Silencing*

NOT until the appearance of the v.p. airscrew did the average person realise how little of the noise made by an aeroplane might be due to the engine exhaust expansion, and when we come to the pusher type yet another source of noise must be considered.

Various people have been surprised to discover that the Douglas- and Carden-engined Drone make much the same noise. Persons without first-hand knowledge have even gone so far as to claim that the Douglas Drone must have a geared airscrew because the noise of its passage is so much more high pitched than that of, for instance, the Tipsy, which has the same engine.

The fact is that in the case of the Drone the "beat" is duplicated as the airscrew blades cut the partial vacuum behind the trailing edge, while the exhaust note forms an unimportant background. It looks as if the multi-engined pusher transport—which is such an attractive idea i.. theory and has, with flat-twelve engines in the leading edge, often been suggested as the type of the future—will be just about the noisiest machine ever made unless the pitch is so high as to be inaudible to all but cats and dogs.

As far as the occupants are concerned the noise question is virutally non-existent. In large machines, such as the new Empire boat and the Douglas D.C.3, I can say from practical experience that the voice need not be raised at all in conversation, while smaller "twins," such as the Dragonfly, set almost as high a standard. With a nose engine it is difficult to get rid of slipstream rattles, though engine "noise" is often the mentally translated effect of minor vibration.

Sooner or later, however, the great mass of earthbound mortals living in the vicinity of aerodromes will raise a concerted wail unless something is done. The modern transport machine usually flies at 10,000ft. or more when on its lawful journeys, so dwellers on air routes will not be troubled, but it is, unfortunately, during the take-off at full throttle and in fine pitch that the noise is really shattering.

INDICATOR.

***Private Flying***

# FROM the CLUBS

**REDHILL**

FOR the fortnight ended January 1, flying times totalled 76 hr. 35 min. at the Redhill Flying Club. Mr. W. E. Davis has gone solo, while Messrs. W. F. Rathbone and J. K. Maxwell have passed their "B" licence tests.

**CAMBRIDGE**

Flying times at Marshalls' School for the week ending on January 3 totalled twenty-one hours. The weather was very poor and for three days practically no flying could be done. Messrs. Gill and Cook joined the School and Mr. Bridge made his first solo.

**C. A. S. C.**

Better weather has resulted in a total of 11 hr. 50 min. being flown during the last week, including a flight by two machines to Gravesend, Mr. Carter making his first cross-country flight as pilot on this trip. Messrs. Gill and Cook have taken their initial flights with the Corps.

**SOUTH COAST**

Club aircraft flew thirty hours during last week. Mr. R. A. Couchman, who took his "A" licence recently, has now joined the Air Force with a Short Service commission. The annual general meeting of the Club will be held next Saturday and will be followed by a dinner dance at the airport.

**DONCASTER**

Owing to very bad weather and the fact that the Club closed down for a week for the Christmas holidays, flying hours for the month only amount to 5 hr. 10 min. A fancy dress carnival was held at the clubhouse on Monday, December 21, and was a great success. Mrs. R. L. Rhodes has joined as a new member.

**PORTSMOUTH**

Flying times for the week ended January 1, 1937, totalled 13 hr. 25 min., the total for the month of December being 75 hr. 50 min. Mr. P. R. Hornidge has qualified for his "A" licence and has gone solo, together with Miss A. Fawsitt and Mr. J. C. Ackerman. New members are Mrs. L. M. May and Mr. L. D. G. Morrison.

**BRISTOL AND WESSEX**

Total flying hours for December totalled 80½ hr., which is a Club record for that particular month, the three previous years being: 1935, 36 hr. 25 min.; 1934, 60 hr. 10 min.; 1933, 42 hr. 50 min. Mr. E. G. Goscombe has gone solo, while Miss H. Pitman has passed her "A" licence tests. Mr. B. M. Davison has joined as a new member.

**HERTS AND ESSEX**

Club aircraft compiled 4,096 hr. 42 min. during 1936. Eleven days were available for flying during the fortnight ended December 31, the number of hours being logged amounting to 100 hr. 59 min. Messrs. Seddon-Holmes and Slaughter have gone solo, and Messrs. MacGregor and Van Leer have passed their passenger tests. The annual Broxbourne Flitch will take place in the clubhouse during the evening of Sunday next.

**HANWORTH**

Owing to the Christmas holidays flying times at the London Air Park Flying Club dropped considerably during the last week. The Club dance held on New Year's Eve at the Hanworth Park Hotel was a great success, and was attended by about 150 people, which included members of the Caravan Club, who held their Christmas meet at Hanworth. Several new private members are housing their aeroplanes in the hangars of the Club.

**MAIDSTONE**

Machines of the Malling Aero Club flew 72 hr. 50 min. during November, and 57 hr. 55 min. during December. These figures may be regarded as very satisfactory in view of the bad weather experienced during the last two months. Flying hours for 1936 were slightly more than double those for 1935. The Club's recently acquired Hawker Tomtit is proving very popular with members who want something more "advanced."

**LIVERPOOL**

Weather conditions during the month of December have been bad and for a number of days Club flying was at a complete standstill, bringing the total number of hours down to sixty-one. Providing enough support is forthcoming a night-landing competition will be held at Speke on Saturday, January 16, while night flying will be held at Speke on Thursday, January 7, commencing at 7 p.m. A treasure hunt will also be held at Hooton on Saturday, January 9, commencing at 8.15 p.m.

**LONDON**

The flying time for the last fortnight amounted to 47 hr. 25 min., the Christmas holidays coming in between. Mr. D. Howell has made his first solo flight and completed the tests for his "A" licence. He was very fortunate in having a spell of good weather which enabled him to go solo and complete the tests for his "A" two days afterwards. Mrs. Davis and Mrs. Clayton have also completed the tests for their "A" licences. New members are Messrs. H. J. Aldington, A. J. Green, and R. A. Chalmers.

**BORDER**

Again last week there were high gusty winds at Carlisle, reaching gale force at times and playing havoc with the windsocks. Needless to say, little flying has been possible and instruction has been confined mostly to blind flying. The committee and officials of the Border Flying Club hope to pay a semi-official visit to the Newcastle Club next Sunday and it is their intention to pay, each month, similar visits to all neighbouring flying clubs. The Club also intend to arrange a dawn patrol on Sunday morning, January 31.

**CROYDON**

There has not been a great deal of flying lately at the Croydon Flying Club on account of bad weather and the usual festivities, but the Club's machines flew 68 hr. 50 min. during the three weeks ended January 2, 1937. Mr. F. C. Nottingham has gone solo after only ten hours' dual, while Mr. D. Beaumont has made several flights to Guernsey in a Puss Moth, on one occasion having to land at night with only the lights of a car to guide him. Flt. Lt. Tattenball is taking a course of blind flying. The directors and members of the Club wish all members of other flying clubs a happy and prosperous New Year.

**BROOKLANDS**

The school and club reopened on Friday, January 1, and in spite of low cloud and drizzle seven hours' flying was logged on the first day. Dr. Sanson was the first member to start activities in the New Year, and Miss Jayne Paget, who has now obtained her "A" licence, did a considerable amount of solo flying. The fixtures for the coming month are as follows: Sunday, January 10, a house party at 5 p.m.; Sunday, January 17, a dance at 4.15; Saturday, January 23, annual general meeting at 4 p.m.; Sunday, January 24, a lecture on navigation at 5 p.m.; and Sunday, January 31, a height judging competition at 3 p.m.

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## *The Isle of Man Again*

LAST year's Isle of Man races were such a success that they will be held again this year on May 29 and May 31—Saturday and Monday. On the first day the London-Douglas handicap race will be held, and on the second there will be two round-the-Island events, one for machines up to 75 h.p. and the other of the open-handicap variety.

Capt. R. H. Stocken (3, St. James's Square, London, S.W.1) will again be the general organiser for the Douglas committee, and all enquiries should be addressed to him.

## *The Oasis Meeting*

THE Royal Aero Club of Egypt has asked the R.Ae.C. to notify intending competitors that the third International Oasis Meeting will take place at Cairo during the five days February 22-26.

The closing date of entries is January 15 and the fee is £5 5s. Late entries will be received up to February 7, at double fees. Full particulars of the meeting can be obtained on application to the R.Ae.C., 119, Piccadilly, London, W.1.

The Egyptian organisers announce that no expenses will be incurred by the competitors other than the cost of fuel needed during the races, and that this fuel will be supplied at reduced prices. Two of the personnel of each aircraft, namely, the pilot and a passenger, will be the guests of the R.Ae.C. of Egypt throughout the meeting. Permits to fly to Egypt will be granted without fee.

## *For Cirrus-Hermes Users*

A WELL-BOUND, loose-leaf Cirrus-Hermes engine instruction manual has been published by Cirrus-Hermes Co., Ltd., Brough, Yorks. Space for personal notes is provided, and the handbook will be kept up to date if changes of address are notified. The price of 4s. 6d. covers the cost of all amendments and the postage.

## *Weather or No*

LAST year the Airwork School of Flying, which is only debarred from activity by Mondays, Q.B.I. and upwards of "Force 5" on the Beaufort Scale, was able to fly on 173 days out of the 365. The comparative figures were 217 in 1935, 239 in 1934, and 281 in 1933. In November only six days were flyable. Q.B.I. was continuously in force, with brief intervals around midday, for over a week towards the end of the month, which was the worst since 1933.

# The TREND of INVENTION

*Recent Aeronautical Patents Revived*

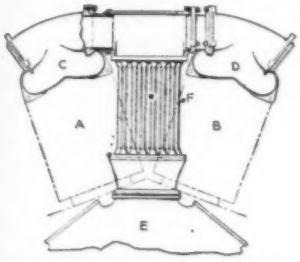
### V.P. Airscrews

WHEN variable-pitch airscrew blades are made of a light alloy it is usually found that the metal is too soft to accommodate the thrust and journal bearings between the root of the blade and the hub. It is therefore necessary for a sleeve of some harder metal, such as steel, to be fitted over the root of the blade, and this sleeve must be securely locked to the lighter metal of the blade. A form of construction by which this can be done is described in this patent. The sleeve has on its internal surface a coarse-pitch thread of rounded profile, and this is screwed on to the root of the blade. To the end of the blade a plate is attached by means of a number of screws, and around the edge of this plate are a series of serrations which fit into corresponding serrations at the end of the metal sleeve.

This system of construction provides a locking method in which the strain is distributed throughout a large mass of metal and in which high localised pressure in the soft metal is avoided. Further, although the sleeve is securely attached to the blade and any movement between it and the end of the blade is prevented during operation, nevertheless it can be easily detached and dismantled when this is required.—*Patent No. 451518: A. G. Elliott, A. A. Rubbra and L. G. Fairhurst.*

### Mixture Cooling

MEANS for cooling the supercharged air or mixture of a radial engine, and so increasing its volumetric efficiency, are described in this patent. The illustration shows a portion of a nine-cylinder




**The Bristol mixture-cooling manifold.**

radial. Two of the cylinders are indicated at A and B, and surrounding them is an annular induction manifold which has an unobstructed bore and which communicates direct with the inlet ports as shown at C and D. At the rear of the crank case is the blower casing E, which contains a centrifugal compressor.

Between each cylinder, connecting the blower casing with the annular induction manifold, are a bank of tubes F through which the supercharged air or mixture passes. The position of the tubes affords adequate cooling and, further, the arrangement of the piping minimises the pressure drop between the compressor and the cylinders.—*Patent No. 450047: Bristol Aeroplane Company, Ltd., A. H. R. Fedden and T. B. Barrington.*

### Boost Control

THE system of controls described in Patent No. 447324 relates to systems in which a supercharger is driven through a two-speed gear and in which there is an automatic control of the throttle opening that depends on the pressure generated by the supercharger. In such cases an over-riding control is provided whereby the pilot can, for short periods, open the throttle irrespective of the boost pressure.

Various forms are described in this patent to make this over-riding device inoperative during the time that the supercharger is driven at the higher speed.

Several ways in which the various controls can be interconnected are shown, in some of which the automatic control of the maximum throttle opening is cut out when desired, provided the supercharger is being driven at the low speed.—*Patent No. 447324: A. A. Rubbra.*

### Automatic Steering

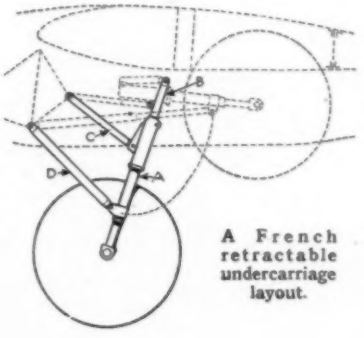
AN improvement in automatic piloting apparatus is described in this patent, which relates to the system described in an earlier patent (No. 416813). In this scheme the rudder and other control surfaces are actuated by a hydraulic servo motor which is controlled by the relative movement between the aeroplane and a gyroscope. Arrangements are also provided whereby the controls can be manually operated, at will, without any interference from the servo-motors.

Means are now provided to assist the pilot in obtaining manual control at any moment and to enable him to do so no matter what the setting of the automatic control may be, or even if the automatic control has ceased to function.

Previously the pilot was able to cut out the automatic control by turning a by-pass valve and so by-passing the oil pressure. Should this throw-out means fail or become inoperative, another valve is provided in the system which enables the pilot to assume control. This latter valve is a safety valve which operates at a pressure slightly in excess of the normal working pressure. If the pilot attempts to operate the controls manually, he will, by exerting sufficient force, cause this safety valve to open, so permitting the operation of the desired control.—*Patent No. 455673: Sperry Gyroscope Company, Inc.*

### Retractable Undercarriage

THE landing wheels of an aeroplane are in some cases carried by a leg which consists of two hinged members, one of which forms the shock-absorber unit, the other being a link of fixed length. A system of retraction for this type of undercarriage is described in patent No. 452324. The wheel is mounted to the lower end of the shock-absorber strut A. The upper end of this strut is hinged to a short rigid strut B, which in turn is hinged to the aircraft. A link C also connects a point on the shock-absorber cylinder A to a fixed point on the aircraft. The lifting jack D is connected to the aircraft at one end, while the other end is connected to the lower portion of the shock-absorber unit.




**A French retractable undercarriage layout.**

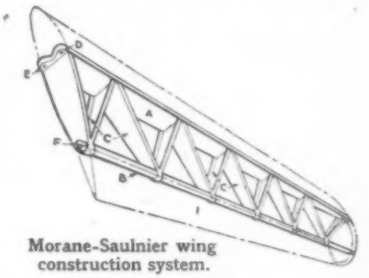
Extension of the jack causes the undercarriage linkage to pivot about the three points above referred to (and it is guided during its retraction by the directing bar C) until it assumes the position shown by the dotted lines.

When the undercarriage is in the lowered position the jack helps to lock the system while allowing the shock absorber to function in its normal manner.—*Patent No. 452324: Société d'Inventions Aeronautiques et Méchaniques.*

### Wing Structure

FOR an improved form of wing structure the inventors claim increased rigidity with the minimum of weight, together with a method of attachment to the fuselage which is rigid and not deformable, and therefore capable of resisting torsional stresses.

Many variations of the invention are described in the specification, but a typical one is shown in the illustration. The main spar is shown at A and is located in line with the centre of main stresses and at a




**Morane-Saulnier wing construction system.**

distance from the leading edge equivalent to one-third the width of the wing. A second spar B is fitted at the trailing edge and may form the hinge support for the aileron I. Between these two spars, triangular bars C are fitted to form a trussed girder construction enclosing triangular cells.

Points D, E and F represent points of attachment to the fuselage. This three-point method of attachment is an important feature of the invention, since the fact that they do not lie along a straight line ensures the rigidity of the whole of the aeroplane. The structure greatly facilitates the work during construction and also reduces the risk of beats or vibrations being set up in the wing. — *Patent No. 450729: Aeroplanes Morane-Saulnier, Société Anonyme de Constructions Aeronautiques.*

### Bomb Traps

IN the type of release gear for bombs in which a radius rod is used to guide the bomb during its early movement, which system was described in Patent Nos. 416884 and 419563, there is in some cases a possibility of the radius rod fouling the edges of the doors of the chamber containing the bomb and thus preventing the doors from closing again after the bomb has been released.

In the present specification a mechanism is described whereby the doors are automatically opened before there is any possibility of the radius rod fouling them, and, further, they remain open until the rod has been withdrawn. These results are effected by a cam mechanism, and the radius rod is returned by a spring which is so arranged to act as a spring check if the rod tends to overshoot its normal position on the return stroke.—*Patent No. 448736: Sir W. G. Armstrong-Whitworth Aircraft, Ltd., and S. W. D. Lockwood.* [cont. overleaf

**The Trend of Invention (Cont.)—**

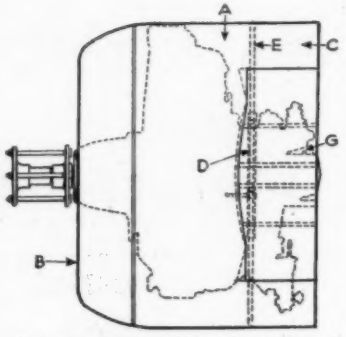
## Controllable Cowling

IN order to reduce the drag of the various parts of the engine, the latter is frequently surrounded by streamline cowling (as is shown at A), known as the N.A.C.A. cowling.

Air normally enters the cowling at B for the purpose of cooling the engine and it leaves through the annular space between the rear edge C of the cowling and the body of the aircraft. In order to vary the rate of flow of the air, and hence the degree of cooling of the engine, two flaps are provided on each side, one of which is shown at G in the sketch.

These hinge about a vertical axis D carried by a circular frame member E which is fixed inside the cowl. The two flaps are connected by a mechanical linkage which can be operated from the pilot's seat or automatically by a thermostat and whereby the position occupied by the flaps can be varied. In this way the flow of air past the engine can be varied to maintain a uniform engine temperature. A further feature enables the flaps to be swung out to a position almost at right angles to their closed position, thus giving easy access to various engine accessories such as magneto, etc., which are usually placed at the rear of the engine and which require periodic inspection.

The movement of the flaps into this open position is effected by disconnecting a ball and socket joint which is easily accessible from the rear edge of the cowl.—*Patent No.* 451525: *Bristol Aeroplane Company, Ltd., and A. H. R. Fedden and F. Mayer.*




**A further development of the Bristol controllable cowling.**

*The latest patents registrations will be found listed on page 22.*

# CORRESPONDENCE

*The Editor does not hold himself responsible for the views expressed by correspondents. The names and addresses of the writers, not necessarily for publication, must in all cases accompany letters intended for publication in these columns.*

### THE MASS-PRODUCTION IDEAL

I WAS very interested by your recent descriptions of new light aircraft under the heading of "Recruits for the Light Brigade," but I would like to point out a rather distressing point, namely, that practically all the ultra-light types of to-day are selling for £200 to £400. As far as I can see, what is required by the masses of people who want to fly, but cannot because of the expense, is an aeroplane costing £100 and available by the instalment plan on the same principle as the car. Taking the Carden engine at £55, surely it would be possible to build an airframe round it for £45 if it were really got down to? Naturally, one does not expect slots, flaps and dozens of instruments, but a small metal airframe with no delicately curved wing tips, etc., and built on the mass-production scale ought to be possible. It seems to me that an airframe of this type would entail very little more labour than the making of the £100 car. On this principle the two-seater should cost about £175 to £185. If only such a machine were forthcoming, then the average man and woman might be able to fly, for, whatever is said to the contrary, only a very few people can afford to own an aeroplane to-day, and until something like the £100 aeroplane is produced I can see very little hope of the private ownership of aeroplanes being available for anyone but the unmarried £1,000-a-year man. Rearmament will not last for ever, so let us hope that as soon as it is over a few, at least, of the manufacturers will attempt to design at any rate a much cheaper aeroplane than we have at present.

London, W.14. P. FLETCHER.

[Editorial comment appears on page 2.—ED.]

### LANDING FEES

I WAS interested to read the letter under the heading "Those Landing Fees" in *Flight* dated December 17. You might be interested to know that the Aerodrome Owners' Association is, at the present time, closely engaged in an effort to draw up a schedule of fees and charges on aerodromes. This is a very difficult task and it is not possible to say how far the Association will be successful; however, we hope that the outcome of our efforts will be a scheme which will prove helpful to aerodrome owners and users of aircraft generally.

London, W.1. H. R. GILLMAN, Secretary,
The Aerodrome Owners' Association.

### INEFFICIENT RADIO OPERATORS

ALL experienced W/T. operators heartily endorse your plea for more efficient use of the existing air W/T. facilities. Thank heavens someone does want the W/O. to be useful and not merely a pest to the pilot. There is no point in fitting Lorenz and other expensive approach beacons when the present equipment is not yet efficiently utilised.

I agree with "Ex-Marine" that only experienced operators should be permitted to sit for the A/C licence. Furthermore, why not do away with the R/T. wavelength of GED. 825 metres (it is used about once a day)? Utilise this wavelength for another W/T. channel and so eliminate much of the jamming with which my experienced colleagues find such difficulty in coping. ANOTHER EX-MARINE.

Croydon.

### CROYDON, GATWICK AND GRAVESEND

I SHOULD like to take this opportunity of expressing my appreciation of "A. Viator's" weekly Croydon news page, in which I have especial interest.

I think that in his contribution in *Flight* of December 10 he stated that as far as his knowledge extended he knew of no figures available relative to the actual visibilities of Croydon, Gatwick and Gravesend.

The following comparisons were published about sixteen months ago: To every 100 fogs at Croydon (presumably of the "sky-obscured" variety) there were 65 at Gatwick and 35 at Gravesend.

Of Gatwick I know nothing, but very often Croydon-bound liners circle Gravesend airport, presumably waiting for another machine to find Croydon before they themselves receive the O.K. to proceed. I believe that on Saturday, November 28, the German machine which arrives at or about noon at Croydon circled Gravesend for twenty-five minutes before finally making for the gloom of London.

However, I must admit that Gravesend appears to conserve electricity to a remarkable extent. I think that a little flash of the main neon obstruction light would very often enable pilots to distinguish the airfield on a misty day; but that is the concern of Airports, Ltd. I can remember that some two years ago, when the airport was fairly extensively used during bad weather, the only thing the ground staff could employ to attract pilots' attention was the illuminated wind-direction sign.

When Croydon is impossible I think Gravesend could quite definitely be used, whereas at present it is very often not so used.

As "A. Viator" probably knows, visibility on the river is no criterion of conditions at the airfield, which is 250 feet above the level of the river. It would be interesting to keep an official set of figures of Gravesend visibility for a month together with those of Croydon and have them compared.

Northfleet, Kent. DONALD G. SOUTHWELL.

## *Research Film at R.Ae.S. Conversazione*

NEXT Tuesday, January 12, the President of the Royal Aeronautical Society, Mr. H. E. Wimperis, C.B., C.B.E., M.A., M.I.E.E., F.R.Ae.S., and Council will hold a conversazione in the Science Museum (Aeronautical Section), South Kensington.

The occasion is the 71st anniversary of the founding of the Society, and during the evening a special film will be shown, by permission of the Air Ministry, and for the first time in this country; it deals with the research work which is being carried out by the Royal Aircraft Establishment and the National Physical Laboratory. A film of bird flight will also be shown.

The reception of members and their guests by the President and Council will begin at 8.30 p.m. Refreshments will be served during the evening. Members should make applications for tickets (5s. each, including buffet) to the Secretary of the Society by Saturday at the latest.

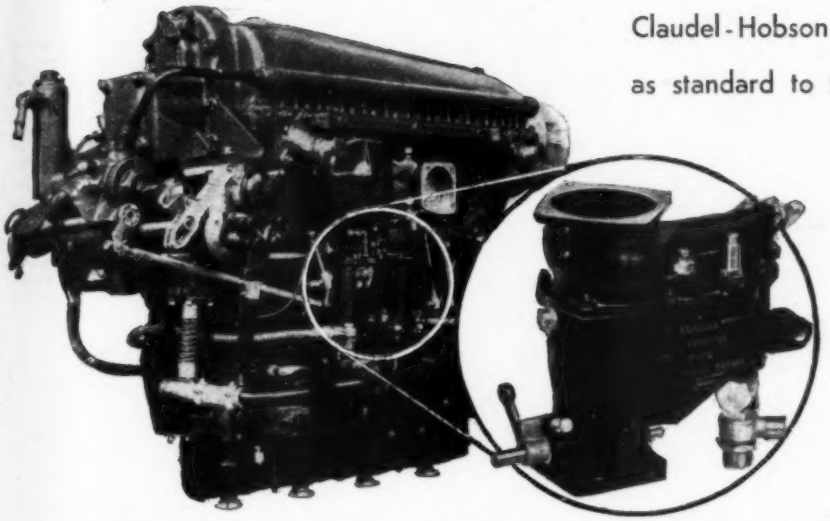


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*Illustration shows type A.I.48 fitted to a Gipsy Major engine.*

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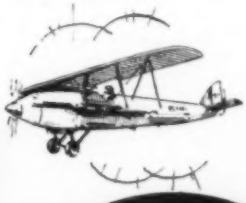

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# COMMERCIAL AVIATION

## — AIRLINES — AIRPORTS —

THE FIRST FOR THIS COUNTRY: Lord Beaverbrook's new Lockheed "12" photographed at Burbank, California. The "12," in standard form, is a six-passenger transport, which, with two 400 h.p. Pratt and Whitney Wasp Juniors, cruises at 213 m.p.h. at about 10,000 ft., and is, in fact, a smaller version of the well-known Electra.

## THE WEEK AT CROYDON

*Praise for Croydon's Blind Approach System : Nautical Mannerisms : Charter Problems*

DESPITE the indignation of our neighbours, backed by hysterical Pressmen, Croydon airport has not yet been handed over to the Jerry builder. Threatened airports live long.

Herr Heitmanek, the expert fog-landing Swiss air pilot, tried out Croydon's Lorenz system one day last week. He reported that the approach with the beacon was perfectly easy and said that the signals came through more clearly than at any other European airport of which he had experience. He feels confident that landings at Croydon with 50-metre cloud height can be made with safety. Some pilots, incidentally, suggest that the outer marker beacon might be just a little farther away. The authorities certainly deserve full marks for their efforts when German, Swiss, French, and other Continental pilots praise the system so highly. Nevertheless, the new approach methods will doubtless give various people on the ground "fits of the jitters," for we at Croydon are unaccustomed to people coming in with absolute safety when the cloud is almost right on the deck and visibility is none too good.

It all sounds and seems very alarming—just as a train travelling in foggy weather might to an aborigine who had no knowledge of the railway lines which cause it to keep its direction.

Mr. Beckman, of Imperial Airways, who lost a leg in the service of that company, is now assisting Capt. Walters with the air pilots' training school, a busy and rapidly growing branch of the Imperial Airways' organisation. Capt. Walters has temporarily replaced Maj. Travers, who is away. Pupils not only obtain theoretical tuition, but make use of such machines as the Wessex and the Avro 652. In winter time, when space permits, they also get plenty of flying on the actual routes, as supernumerary first officers.

A number of wireless officers are also undergoing training, but in their case the Imperial Airways' school is what the "finishing school" is to the nicely educated young lady. In other words, they know all their stuff backwards, except such special training as is necessary for flying, for they have mostly done a fairly long spell at sea in the merchant service. Many of them come from the North, Hull and Grimsby way, and, besides a North Country accent which endears them to the lady in charge of the buffet, they are prone to wear fishermen's jerseys and to chew tobacco. Some of the older pilots are said to be busy acquiring similar nautical habits, but they say that it is less difficult to arrange to fire machine-gun bullets through a revolving airscrew than to synchronise, with nicety, expectoration through a beard.

### *Passengers, "Patient" and Otherwise*

One day last week there was one of those ambulance flights, which, in these days, goes without comment. A K.L.M. Douglas arrived whilst I happened to be on the tarmac, and before the machine had taxied to position an ambulance had drawn up. Customs and emigration people very helpfully went out to the machine and cleared the invalid, who was then carried from the cabin, stretcher and all, and placed in the ambulance. Within a few minutes of arrival the ambulance had left for town and the aeroplane had taxied to the hangar. The majority of companies now have specially designed stretchers to fit neatly into place in machines, and for long journeys K.L.M. has adopted a device of mirrors whereby the patient, though recumbent, may observe the aerial and earthly scenery.

One of the minor difficulties encountered by special charter companies concerns the pathetic faith held by their clients in their ability to "get through" in any sort of weather. When such a company has to turn down a flight because weather conditions are impossible the client is most hurt. Not long ago another aspect of the case cropped

**Commercial Aviation**

up. An important person wanted to hire a special aeroplane from a well-known charter firm to visit the British Embassy in a certain Continental capital. The weather was really too bad and the firm said so. Shortly after this the indignant client rang through to say that the weather over there was not at all bad. The company replied that the Meteorological Office, with hourly reports at its disposal, said it was very bad indeed. To this the client triumphantly retorted that the Meteorological Office must be wrong, for he had spoken personally to no less highly placed an official than the Ambassador himself.

A. VIATOR.

## Nearly All Air

ONE more step in the elimination of the present train journey involved in a journey by Imperial Airways to Africa or the East was made in practice last week-end. In future passengers will travel by train from Paris to Marseilles (instead of Brindisi), where they will board the flying boat for Brindisi and Cairo. *Castor* was the first passenger boat to pick up its load at Marseilles.

## Successful "Cramming"

IN November the Imperial School of Air Navigation completed its first year's "operations," during which 101 day, 25 night and 73 correspondence course students have passed through Mr. Martin's hands. As a result of a last-minute alteration, the first figure was incorrectly given in last week's issue as 105, but the difference is hardly important.

The detailed results of the last examination for second class navigators are not yet through, but for the April and June events the proportions were as follows. April: 33 students entered, 19 passed, and 11 failed in one subject only. June: 14 students entered, 9 passed, and 3 failed in one subject only.

The next series of classes will start on January 12.

## A Calculating Protractor

THE pilot of to-day is beset with so many problems demanding rapid solutions that any instrument designed to simplify the work should find a ready sale. Airco, Ltd., of 3, St. James' Square, London, S.W.1, have recently produced a combined protractor and calculator which has been, in fact, designed by Mr. S. J. Gilbert, of the same company.

Briefly, this instrument consists of a square transparent protractor with a length of gut for course measurement, and incorporating an Appleyard scale calculator which may be used not only to solve time, distance and speed problems but which can also be used to calculate fuel consumptions and, with the help of a few memorised conversion factors, to transmute various units of distance. Arrows are etched against the scales in order to simplify the latter procedure. Provided that the simple method involved is practised, calculations can be made almost instantaneously in all cases, and it is possible, of course, to work out one's ground speed in the first place, and from this to estimate a time of arrival—a knowledge useful to any pilot flying in thick weather. The usefulness of the logarithmic principle is hardly considered by the average private owner—even by those owning C.D.C.s.

The Gilbert protractor, which is small enough to be conveniently disposed in one's pocket, is sold for 17s. 6d.

## Last Tributes to Mermoz

A MEMORIAL service, held at the Chappelle St. Louis des Invalides in Paris, on Wednesday of last week (December 30), marked the final stage in the tragedy of Jean Mermoz, who, with Pichodou (second pilot), Ezan (navigator), Lavidalie (mechanic), and Cruvelhier (radio operator), vanished in the South Atlantic with the Latécoère flying boat *Croix du Sud*, on December 7. The Air Minister, M. Pierre Cot, representing the French Government and Nation, officials of Air France and a funeral guard from the Army with muted drums and bugles, stood around a flower-decked cenotaph and paid their last tribute with military honours reserved for soldiers and heroes, while three Air France liners, escorted by a squadron of fighting machines, circled overhead.

No accident in recent times has so profoundly shocked the French people, to whom Mermoz had communicated his personality as the relentless pioneer of the first air mail service to span the ocean at a single hop on a regular schedule. During the preceeding week M. Louis Allegre, Director General of Air France, had made a double journey across the South Atlantic, all within the space of forty hours, to perform a funeral act on behalf of the administration and personnel of the company. On passing over the spot where the *Croix du Sud's* last message was picked up he dropped a wreath on the waters. This gesture expressed the confidence of Air France in their 9,600 miles air route to Santiago, Chile, built up from the Toulouse-Barcelona air service, which started at far back as 1918.

## Mersey Ferry

WITH the idea of running a thrice-daily service between Hooton Park and Speke and, probably, a passenger service to North Wales, Utility Airways, of Hooton, has recently purchased a De Luxe Monospar. The machine was flown north from Hanworth by Mrs. Davidson (Miss Joy Munro as was), who, with her husband, is a director of the firm.

## British Airways' Year

DURING 1936 British Airways' services ran with a percentage regularity of 95.7 over all routes and carried 21,000 passengers. The passenger-mile figure was just over 2½ million, and 3,500,000 lb. of mail has been carried. The last figure—for the nine months or so during which the company held the mail contract—is equivalent to some 23 million letters.

## "Cavalier" in Bermuda

LAST week the Short Boat *Cavalier*, which is to operate the experimental Bermuda-New York service with a Pan-American S.42 B, arrived at Bermuda. When the machine has been assembled it will be flown about the district in order that the various radio, navigational and meteorological problems can be studied.

Meanwhile, the first long-distance boat's sister ship, *Cambria*, is almost complete.

## Linking the Western Isles

EVERY island on the west coast of Scotland from Arran to Lewis is to be surveyed within the next few weeks. Mr. Glyn Roberts, director of West of Scotland Air Services, Glasgow, will carry out the survey for an at present unnamed company. A plan is in hand not only to establish bases at Gourock, Mull, Skye, and Stornoway, but to include almost every Scottish island where it is possible to provide safe flying-boat anchorage.

## Growing Up

DURING the three years in which their services have been in operation, Jersey Airways' traffic figures have progressively increased. In 1934 the company carried 19,000 passengers; in 1935 the figure was 25,000; and in 1936 it topped 30,000. Starting with one D.H. Dragon, the fleet now consists of six D.H. 86s and three D.H. 89s.

Jersey's airport should be available for use early in March, and after that month the London-Jersey service will cease to call at Alderney. A special service will thereafter run between Jersey and this island.

## The Crawley Accident

VERY little additional information came to light at the inquest, held last week, on the two victims of the British Airways' crash near Crawley on November 19.

The radio operator, Mr. C. G. Wheeler, said that Gatwick had been circled preparatory to making the final approach and that he was in communication with the airport until within half a minute of the impact. He saw trees beneath the machine and called to the pilot, but was not sure whether his voice was heard.

The engineer, Mr. G. R. Blowers, said that he was asked by the pilot for the position of the landing light switch, and the coroner very aptly remarked that such a question from the pilot was extraordinary.

Mr. E. Simmonds, senior control officer at Gatwick, said that continuous bearings were given and that the airport was fully lighted at the time. No change in the airport radio equipment had been considered necessary since the accident. Mr. W. van Oppen, assistant aircraft superintendent at Gatwick, said that this was the pilot's first complete night trip, but that he had flown it by day on two previous occasions. He denied that pilots generally were dissatisfied with conditions at Gatwick as a night-flying base.

A point which was not brought up at the inquest was that, to the best of our knowledge, no K.L.M. pilot had been permitted to take full charge of a Fokker F.XII until he had completed at least fifty hours as co-pilot in the type.

# THE ROYAL AIR FORCE

SERVICE NOTES AND NEWS — AIR MINISTRY ANNOUNCEMENTS

## HALF-YEARLY PROMOTIONS

The undermentioned promotions are made with effect from January 1, 1937:

*GENERAL DUTIES BRANCH.*

*Air Chief Marshal to be Marshal of the Royal Air Force.*

Sir Edward Leonard Ellington, G.C.B., C.M.G., C.B.E.

*Air Marshal to be Air Chief Marshal.*

Sir Hugh Caswall Tremenheere Dowding, K.C.B., C.M.G.

*Air Vice-Marshal to be Air Marshal.*

Wilfrid Rhodes Freeman, C.B., D.S.O., M.C.

*Air Commodores to be Air Vice-Marshals.*

Hazelton Robson Nicholl, C.B.E., Lawrence Arthur Pattinson, D.S.O., M.C., D.F.C., and William Lawrie Welsh, D.S.C., A.F.C.

*Group Captains to be Air Commodores*

Charles Hubert Boulby Blount, O.B.E., M.C., Ernest William Norton, D.S.C., Arthur Clinton Maund, C.B.E., D.S.O., Charles William Nutting, O.B.E., D.S.C., and Robert Leckie, D.S.O., D.S.C., D.F.C., A.D.C.

*Wing Commanders to be Group Captains*

Henry Ivan Hanmer, D.F.C., Arthur John Capel, D.S.O., D.F.C., Ralph Towlerton Leather, A.F.C., John Henry D'Albiac, D.S.O., George Brindley Aufrere Baker, M.C., Roy Maxwell Drummond, D.S.O., O.B.E., M.C., Arthur Noel Gallehawk, A.F.C., Arthur Conningham, D.S.O., M.C., D.F.C., A.F.C., Eustace Osborne Grenfell, M.C., D.F.C., A.F.C., Forster Herbert Martin Maynard, A.F.C., Douglas Iron, O.B.E., Francis John Linnell, O.B.E., and John Hilliard Simpson.

*Squadron Leaders to be Wing Commanders*

William Arthur Kirkpatrick Dalzell, Frederick Arthur Norton, George Maxwell Lawson, M.C., Geoffrey Arthur Henzell Pidcock, Seymour Stewart Benson, A.F.C., George Cecil Gardiner, D.S.O., D.F.C., Arnold Samuel Thompson, Sydney Edward Toomer, D.F.C., Herbert Martin Massey, D.S.O., M.C., Desmond Herlouin de Burgh, A.F.C., William Forster Dickson, D.S.O., O.B.E., A.F.C. (Acting Wing Commander), Henry George Watts Lock, D.F.C., A.F.C., Cedric Ernest Victor Porter, Oswald Robert Gayford, D.F.C., A.F.C., Robert Allingham George, M.C., Kenneth Buchanan Lloyd, A.F.C., Edward Reginald Openshaw, A.F.C., Owen Washington de Putron, Herbert Victor Rowley, Bertrand Alexander Malet, D.F.C., Philip Herbert Mackworth, D.F.C., Gilbert Formby Smylie, D.S.O., Harvey Lancelot Macro, D.F.C., A.F.C., Leslie Millington Iles, A.F.C., Henry Danboyne O'Neill, A.F.C., Albert Oliver Lewis-Roberts, D.F.C., George Stairs Napier Johnston, Allan Robert Churchman, D.F.C., Charles Basil Slater Spackman, D.F.C., Stanley Flamank Vincent, A.F.C., Burton Ankers, D.C.M., William Kinnear Mercer, Edward Goodwin Hilton, D.F.C., A.F.C., John Melbourne Mason, D.S.C., D.F.C., Gerard Stephen Oddie, D.F.C., A.F.C., Arthur Percy Ledger, M.B.E., John Whitford, O.B.E., Noel Parker Dixon, A.F.C., Edward Michael Conolly Abel-Smith (Commander, R.N.), and Tom Oliver Bulteel (Commander R.N.).

*Flight Lieutenants to be Squadron Leaders*

Charles James Wilfred Hatcher, A.F.C., Francis Herbert Donald Henwood, D.F.C., James Cornelius Stevens, Findlay Willard Sinclair, D.F.C., Sidney James Bailey, M.B.E., Michael Sullivan Keogh, A.M., Leopold Herbert Stewart, William Badley, Frank Henry Whitmore, M.B.E., D.S.C., Cecil Walter Harrison, Douglas William Mackendrick (Lieutenant Commander, R.N.), Henry Austin Traill (Lieutenant Commander, R.N.), Cecil Archer Norgate Hooper (Lieutenant Commander, R.N.), and Anthony Cuthbert Guy Ermen (Lieutenant Commander, R.N.).

*Flying Officers to be Flight Lieutenants*

Merlin Bruce (Lieutenant, R.N.), Ian Ross Sarel (Lieutenant, R.N.), Donald Hugh Elles (Lieutenant, R.N.), John Casson (Lieutenant, R.N.), Rupert Claude Tillard (Lieutenant, R.N.), Dermod Donatus O'Brien (Lieutenant, R.N.), and John Hamilton McCahon (Captain, R.M.).

*EQUIPMENT BRANCH*

*Wing Commanders to be Group Captains*

Cuthbert Leopold Archbold, O.B.E., William Millett, O.B.E., and Frederick Alfred Baldwin.

*Squadron Leaders to be Wing Commanders*

Archibald James Briddon, Arthur William Smith, Wilfrid Charles Green, M.C., Frederick Ralph Wilkins, Thomas Edward Drowley, O.B.E., Arthur Garrity, and Harry Leonard Woolveridge.

*ACCOUNTANT BRANCH*

*Wing Commander to be Group Captain*

James Leask Robertson.

*Squadron Leaders to be Wing Commanders*

Charles Henry Moore, Reginald Byrne, M.C., and John Swire Griffiths.

*MEDICAL BRANCH*

*Group Captain to be Air Commodore*

Basil Alfred Playne, D.S.O., M.B., B.Ch., M.R.C.S., L.R.C.P.

*Wing Commanders to be Group Captains*

Richard John Aherne, M.C., L.R.C.P. and S., and Thomas Montgomery, M.D., B.Ch., D.P.H

*Squadron Leaders to be Wing Commanders*

John Gerald Russell, M.B., B.Ch., John Beaumont Gregor, M.R.C.S., L.R.C.P., Reginald Horace Stanbridge, M.R.C.S., L.R.C.P., D.P.M., Roy Weatherley White, M.R.C.S., L.R.C.P., Gerald Peter O'Connell, M.B., B.Ch., and Alexander Dickson, M.B., Ch.B., F.R.C.S. (E).

*Air Chief Marshal Sir Edward L. Ellington, G.C.B., C.M.G., C.B.E.*, who is only the third officer to attain the rank of Marshal of the Royal Air Force, was born in London in December, 1877, and was educated at Clifton College and the Royal Military Academy. He was commissioned in 1897 to the Royal Artillery and, in succession, was promoted Lieutenant and Captain in that arm. He graduated at the Staff College, Camberley, in 1907-8. In 1912 he began flying and graduated as a pilot, his Royal Aero Club ticket being No. 305 of October 4, 1912. He was appointed to the Royal Flying Corps in the following year.

He went to France on regimental duty in August, 1914, and was employed in France on the staff from September, 1915, to February, 1916. He was then posted to a staff appointment at the War Office and at the end of that year proceeded again to France on staff duties. Towards the end of 1917 he returned to the War Office as Deputy Director General of Military Aeronautics, and in January, 1918, he was appointed Director General of Military Aeronautics. In the meantime (1917) he had been promoted to the rank of Brigadier General: on April 1, 1918, he was promoted to Major-General in the Royal Air Force. In August, 1918, he was appointed Controller General of Equipment at the Air Ministry, and on the reorganisation of the Ministry in February, 1919, he became Director General of Supply and Research.

For his services in the Great War he received the awards of C.B., C.M.G., and C.B.E., with two brevets, and was mentioned in despatches on three occasions, besides having several foreign Orders bestowed upon him. He was awarded the K.C.B. in the Birthday Honours List of 1920 and G.C.B. in the List of 1935.

In 1922 he proceeded to Egypt to take over the command of the Royal Air Force, Middle East, and in 1923 he was posted to India on appointment as Air Officer Commanding, Royal Air Force, India. In November, 1926, he became Air Officer Commanding, Royal Air Force, Iraq, a post which he held until he was appointed in January, 1929, to be Air Officer Commanding-in-Chief, Air Defence of Great Britain. In September, 1931, he became Air Member of Council for Personnel at the Air Ministry, and in May, 1933, he was appointed Chief of the Air Staff.

In August, 1919, Sir Edward Ellington was granted a permanent commission in the Royal Air Force with the rank of Air Vice-Marshal. He was promoted Air Marshal in July, 1929, and Air Chief Marshal in January, 1933. He was appointed principal Air A.D.C. to His Majesty from March, 1930, to November, 1933.

During his command in India Sir Edward Ellington was responsible for conducting the first operations of magnitude in India in which the Royal Air Force was used independently of the Army to deal with a situation that had got beyond the resources of the political officers. These operations, which took place against the Mahsuds in 1925, were entirely successful and were achieved at comparatively small cost. While he was in command in Iraq he also conducted certain operations against recalcitrant tribes which entered Iraq from the neighbouring country of Nejd. These, too, were brought to a successful and rapid conclusion.

## ANOTHER NEW SQUADRON

No. 42 (Torpedo-Bomber) Squadron formed at Donibristle on December 14, 1936. It has been placed in the Coastal Command.

## AIR MINISTRY APPOINTMENTS

The Right Honourable Viscount Swinton, G.B.E., M.C., Secretary of State for Air, has appointed Mr. F. H. Sandford to be his Principal Private Secretary in succession to Mr. P. J. Oldfield (promoted) and Mr. R. C. Chilver to be his Assistant Private Secretary, vice Mr. Sandford, with effect from January 17, 1937.

The Air Ministry announces the following changes in the higher civilian staff:—

Mr. L. V. Meadowcroft to be Principal Assistant Secretary and Director of Contracts vice Mr. B. E. Holloway, C.B., who retires on January 16.

Mr. J. B. Abraham, C.B., to be Principal Assistant Secretary vice Mr. C. R. Brigstocke, C.B., who retired on December 31.

## ELECTRICAL AND WIRELESS SCHOOL

The following are extracts from the report by the Officer Commanding, Electrical and Wireless School, Cranwell, on the Passing Out Inspection, December 22, 1936. The inspection was carried out by Air Vice-Marshal E. L. Gossage, D.S.O., M.C.

The strength of the entry now passing out is fifty-seven, of whom thirty-nine entered by Air Ministry Competitive Examination and eighteen by direct entry with School Leaving or Matriculation Certificates. Forty-eight of these apprentices have been trained as wireless operator mechanics and the remaining nine as instrument makers. The average age of this entry is eighteen and a half years. The total strength of apprentices on December 1, 1936, was seven hundred and twenty-four.

The results obtained by the forty-eight Wireless Operator Mechanics aircraft apprentices are: Twenty have passed out as Aircraftmen 1st Class; twenty-four have passed out as Aircraftmen 2nd Class. The remaining four have failed to qualify, and of these, two have been recommended for a further period of training, whilst the others have been recommended for remustering to Wireless Operator, Group II.

The results obtained by the nine Instrument Maker aircraft apprentices qualify them to pass out as follows:—One as Leading Aircraftman; four as Aircraftmen 1st Class; four as Aircraftmen 2nd Class.

*Award of Cadetships*

The following apprentices have each been awarded cadetships at the Royal Air Force College:—Sergt. Apprentices J. A. Holmes and G. Robertson.

The Hyde-Thomson Memorial Prize has been awarded to Sergt. Apprentice J. A. Holmes.

## A NEW BOMBING RANGE

A high-altitude practice bombing range has been constructed at Berners Heath, Suffolk, and became available, with bye-laws, for general use as from December 15, 1936. The range is administered by the C.O., R.A.F. Station, Mildenhall.

## No. 9 FLYING TRAINING SCHOOL

The undermentioned officer and airmen have been awarded the special assessment shown hereunder, on completion of a course of flying training at No. 9 Flying Training School, Thornaby:—

*Distinguished Pass*

A.P/O. L. S. Dawson, Cpls. Boxall, C. T., and Knott, R. H., A./Sgts. Kime, L. G., Shipman, E. A., and Sumner, F.

## CADETS FROM AUSTRALIA

In the issue of *Flight* of November 5 last a statement was published to the effect that "in future fifty cadets are to be sent from Australia annually." This should have read that the number has been increased from fifteen to fifty for the year 1937 only, after which the number will revert to the region of the original figure.

## ADVANCED ENGINEERING COURSE

The undermentioned officer, having successfully completed the advanced engineering course at Cambridge University in June, 1936, obtaining the degree indicated, is awarded the symbol E*: Flt. Lt. F. Whittle, B.A. (1st class Mechanical Sciences Tripos).

## FLYING ACCIDENTS

The Air Ministry regrets to announce that Sgt. Stanley James Ower lost his life, and Corpl. Brean Thomas Alfred Hobbs was slightly injured, in an accident which occurred near Brackley, Northamptonshire, on December 30, to an aircraft of No. 18 (Bomber) Squadron, Upper Heyford. Sgt. Ower was the pilot of the aircraft and Corpl. Hobbs the passenger.

Also that L.A/C. Frank William Barrett lost his life, and Sgt. Norman Pickard was injured, as the result of an accident which occurred at North Tidworth on January 1, to an aircraft of No. 6 Flying Training School, Netheravon. Sgt. Pickard was the pilot of the aircraft and L.A/C. Barrett the passenger.

# ROYAL AIR FORCE GAZETTE

*London Gazette, December 29, 1936*

*General Duties Branch*

Flt. Lt. R. Sorel-Cameron is granted a permanent commission in that rank (December 9).

The following Flight Lieutenants are granted permanent commissions in that rank (December 28):—R. C. M. Collard, W. P. Harvey, E. V. Knowles, G. P. Woodhouse.

The following Pilot Officers are promoted to the rank of Flying Officer on the dates stated:—E. K. Piercy (October 3); J. D. C. Joslin (October 16).

F/O. T. G. Young is placed on the half-pay list, Scale B (December 23).

The following Flight Lieutenants are transferred to the reserve, Class A, on the dates stated:—J. R. Talbot (December 28); G. Hinckley (December 29).

Flt. Lt. F. W. Murison (Lt., Royal Artillery, T.A. Reserve of Officers) is transferred to the reserve, Class C (December 6); Acting Pilot Officer on probation P. A. B. Neel relinquishes his short-service commission on account of ill-health (December 28).

*Medical Branch*

The following Flying Officers are promoted to the rank of Flight Lieutenant with effect from December 2, and with seniority of the dates stated:—L. M. Crooks, M.B., Ch.B., C. F. R. Briggs, M.B., B.S., M.R.C.S., L.R.C.P. (December 2, 1935) W. J. Fowler, L.M.S., M.D. (December 6, 1935).

*Dental Branch*

The following Flying Officers are promoted to the rank of Flight Lieutenant on the dates stated:—R. M. Brown, L.D.S. (December 2, seniority October 5, 1936); W. E. Nelson, L.D.S. (December 2).

## ROYAL AIR FORCE RESERVE

*Reserve of Air Force Officers*

*General Duties Branch*

The following are granted commissions as Pilot Officers in Class AA (December 29):—A. J. MacK. Chadwick, A. D. Frank, P. H. G. Newhouse, T. H. Roberts.

F/O. F. R. Newell relinquishes his commission on appointment to a commission in the Royal New Zealand Air Force (June 1).

## AUXILIARY AIR FORCE

*General Duties Branch*

No. 601 (COUNTY OF LONDON) (FIGHTER) SQUADRON.—P/O. J. G. Grace resigns his commission (June 8).

No. 602 (CITY OF GLASGOW) (BOMBER) SQUADRON.—A. A. McKellar is granted a commission as Pilot Officer (November 8).

## AUXILIARY AIR FORCE RESERVE OF OFFICERS

*General Duties Branch*

J. G. Grace is granted a commission as Pilot Officer in Class C (June 8).

# ROYAL AIR FORCE INTELLIGENCE

**Appointments.**—The following appointments in the Royal Air Force are notified:—

*General Duties Branch*

*Squadron Leader.*—C. F. Sealy, to Special Duty List; whilst employed on Armament duties with Superintendent of Design at the Royal Arsenal, Woolwich, 15.12.36.

*Flight Lieutenants.*—W. N. McKenchnie, E.G.M., to R.A.F. Station, Cranwell, 6.12.36. J. A. Dixon, to No. 269 (General Reconnaissance) Squadron, Bircham Newton, 7.12.36.

*Pilot Officers.*—B. Bell, T. M. Lockyer, P. M. Astley, to No. 269 (General Reconnaissance) Squadron, Bircham Newton, 7.12.36.

*Acting Pilot Officer.*—R. H. Warcup, to No. 269 (General Reconnaissance) Squadron, Bircham Newton, 7.12.36.

*Equipment Branch*

*Flying Officers.*—F. Gale, to R.A.F. Station, Cranwell, 16.12.36. C. H. V. Harding, to No. 1 M.T. Storage Unit, Hendon, 16.12.36. G. Jones, to No. 1 Stores Depot, Kidbrooke, 16.12.36. C. E. Lindsell, to R.A.F. Station, Cardington, 16.12.36. L. Mitchell, to No. 4 Stores Depot, Ruislip, 16.12.36.

*Pilot Officers.*—F. G. Carle, to R.A.F. Station, Donibristle, 16.12.36. F. B. King, to R.A.F. Station, Manston, 16.12.36.

*Medical Branch*

*Flying Officers.*—D. W. I. Thomas, R. F. Courtin, D. J. Dawson, to Princess Mary's R.A.F. Hospital, Halton, 17.12.36. P. A. Lee, to Home Aircraft Depot, Henlow, 17.12.36. A. R. Sibbald, to No. 5 Flying Training School, Sealand, 17.12.36. R. H. Pratt, E. W. R. Fairley, to R.A.F. Hospital, Cranwell, 17.12.36. J. Conroy, to No. 7 Flying Training School, Peterborough, 17.12.36. N. P. R. Clyde, to No. 1 Flying Training School, Leuchars, 17.12.36. C. E. G. Wickham, to R.A.F. Station, Manston, 17.12.36.

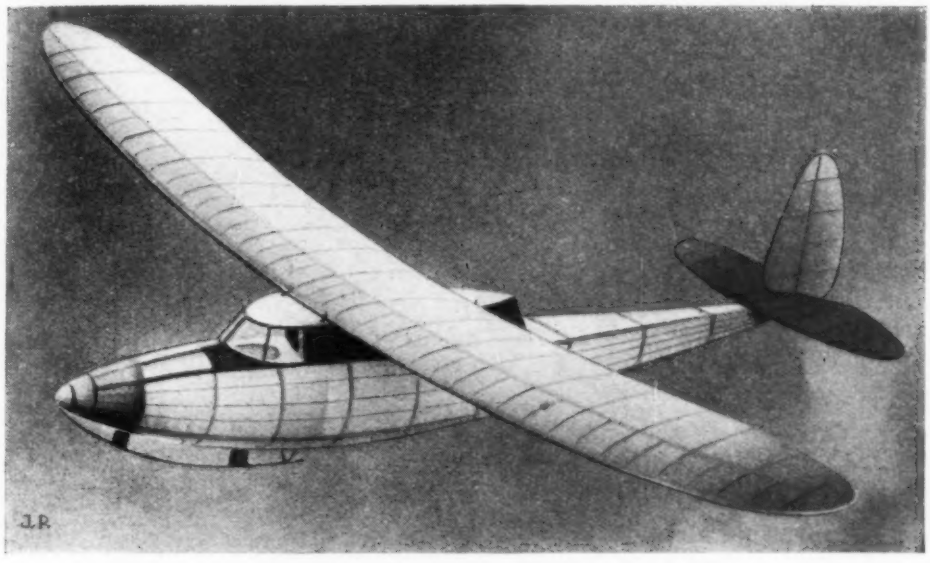
*Accountant Branch*

*Flying Officer.*—D. Lumgair, to R.A.F. Station, Wyton, 16.12.36.

# MODELS

## *Modern Glider Practice : Indoor Flying : Enthusiasm in Germany and Sweden*

By M. R. KNIGHT




**Grace of line and delicacy of workmanship that put one in mind of the denizens of Dunstable Down—Mr. J. C. Smith's 40½ in. span glider**

### *Powerless*

ONE of the most popular items in the Model Flying Display given at the Hurlingham Club during the last four summers has been the catapulting of a glider by Mr. J. C. Smith, competition secretary of the S.M.A.E. and vice-chairman of T.M.A.C. This launching system has now been adopted for the annual S.M.A.E. gliding contest.

The glider here described is the latest of a successful series by Mr. Smith. It is built of balsa wood and birch, and weighs 5½ oz. The wing is mounted on a streamlined cabin which is detachable, and is secured to the fuselage interior by four rubber bands passing through tubes in the cabin and anchored to hooks lashed to the base of the two fuselage bulkheads. This high position of the wing has proved very satisfactory.

The span is 40½ in., and the maximum chord 6 in. At the centre the wing section is Clark Y, but it changes to bi-convex, and becomes symmetrical towards the tips, which are given a slight wash-out. The dihedral is applied by curving the spars, as in the *Pou-du-Ciel*. The distinctive plan form has proved equally effective for gliding and power flight.

Each full rib is slotted to fit over a balsa main spar, which tapers in depth from ¾ in. to ¼ in. The rib ends rest in recesses in the leading and trailing spars, the former being ⅜ in. × ¼ in. balsa, rounded off, and the latter ½ in. × ¼ in. balsa, sandpapered to a sharp edge. Bamboo strip, reinforced with solid balsa, forms exceedingly robust wing-tips.

The U-section fuselage consists of four balsa longerons, two bulkheads of ⅛ in. plywood, numerous stringers of silk cord, and a keel of ¼ in. × ¼ in. birch, to which a 19-gauge skid wire is attached by means of plywood spacers. The wire projects 1½ in. behind the wing leading edge to form a towing hook, and an adjustable catch enables the fore and aft position of the towing pull to be varied. Balsa sheet, covered with bamboo tissue, is used for the cabin sides. The fin is built integral with the fuselage, and consists of a centre post of ⅛ in. × ⅛ in. birch, and an edging of $\frac{3}{32}$ in. × $\frac{3}{32}$ in. bamboo.

The tail-plane, of thin symmetrical section, is mounted ahead of the fin, and is detachable. The span is 12 in. and the maximum chord 3½ in. Ribs and main spar are of balsa, but the edging is of 28-gauge wire.

Bamboo tissue was used for covering the wing and the fore part of the fuselage, and superfine tissue for the tail and the rear of the fuselage. The upper surface of the wing was given two coats of clear dope, all other surfaces receiving one. The wing is mounted parallel to the datum-line, with the tail-plane set at a small negative incidence.

The launching cord consists of 50 ft. of $\frac{1}{16}$ in. × $\frac{3}{64}$ in. rubber (⅛ in. × ⅛ in. in windy weather), and an equal length of thread. One end terminates in a ring which slips over the rear end of the landing skid, the other end being anchored to the ground. The glider is released from such a distance behind the point of anchorage as will stretch the cord sufficiently to give adequate impetus. On parting company with the glider, the cord is returned gently to earth by means of a parachute.

### *Indoor Achievements*

THE Albert Hall meetings are attracting models of considerable interest, and leading to numerous record-breaking flights. Mr. E. Ross, a member of the Northern Heights Club, and one of the stars of the model world, who recently established a British Indoor Fuselage Record of 151.6 sec., has since raised this record to 3 min. 47 sec. His model, it may be recalled, is a microfilm-covered parasol, with short diamond-section fuselage terminating in a slender spar which carries the tail. It struck an overhead wire, and nearly half of the tail-plane folded down flush with the inverted fin, in which condition the model flew strongly for over three minutes!

Mr. T. H. Ives (Hayes and District Club) achieved 6 min. 21 sec. with a microfilm spar model, and a similar machine flown by Mr. R. Copland (Northern Heights), who won third place in the 1936 Wakefield contest, set up an unofficial record of 15 min. Mr. T. Newell (North Kent Club), whose outdoor twin-tractor Falcon was described in *Flight* of February 6, 1936, carried out short tests with a small indoor version. This had a wing span of 18 in., weighed ½ oz., and employed three-bladed airscrews.

It has been found necessary to alter the dates of the next two indoor meetings owing to the Albert Hall being required for other purposes. They will now be held on Thursdays, January 7 and 21, from 7.30 to 10 p.m. [*Continued overleaf.*

***Models—continued.***

### *From Germany and Sweden*

HERR HORST WINKLER, the best-known exponent of model aeronautics in Germany, flew over specially to attend one of the Albert Hall meetings. Subsequently, he lectured on stability to the members of the Blackheath Club. English aeromodellists who have visited Germany are greatly impressed with the Winkler glider, and copies are being built in this country. With these heavy models extremely fine glides have been obtained from level ground.

On another Albert Hall occasion I had the pleasure of meeting M. Harald Vilen, the managing director of a model aircraft store in Sweden, and hearing from him of the phenomenal spread of interest in model aeronautics in his country. The principal club, the Allers Flygklubb, which is conducted by a boys' weekly paper, has secured a membership of no fewer than 96,000 during the last fifteen months, and one of their recent flying meetings attracted 10,000 spectators. The German heavy glider, with its fast but very flat glide, is greatly in vogue, and excellent soaring flights are frequently obtained. The rubber-driven models, mostly high-wing monoplanes, have very slender fuselages, the S.M.A.E. fuselage formula not being followed in that country. They are mostly constructed of balsa wood and Jap tissue. Birch silk, and geared motors are used only to a limited extent. There is not yet much activity with petrol-engined models.

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Master W. Fenner, of 42, Alexander Avenue, Rose Park, South Australia, wishes to correspond with young enthusiasts in Britain.


## *COMMERCIAL AIRCRAFT and AIRPORTS*

FLIGHT of Thursday week, January 21, appearing during the Airports Exhibition, will be a Special Number devoted to Commercial Aircraft, Airports and Equipment.

***Thursday*** FLIGHT ***January 21***


## COMPANY MEETINGS

THREE company meetings of considerable interest have recently taken place—those of the Fairey, Airspeed and British Marine Aircraft concerns.

On December 31 the **Fairey Aviation Co., Ltd.,** held its eighth ordinary general meeting, with Sqn. Ldr. M. E. A. Wright, A.F.C., in the chair (in the absence of Mr. C. R. Fairey, through illness). Sqdn. Ldr. Wright reported that the year's working up to September 30, 1936, showed a profit of £60,176 as compared with £39,112 for the previous year. He explained that the rearmament programme came at rather an awkward time from the company's point of view, and they found themselves faced with the problems of opening a new factory, enlarging existing ones and putting no fewer than four new types of aircraft into production almost simultaneously.

They had in hand larger orders than ever before in the company's history. The bulk of the work on the new plant at Stockport was now finished, the factory was producing, and should reach full output by the middle of 1937. They had come to an arrangement with the Manchester Corporation by which they had obtained the use of Ringway aerodrome and would erect buildings there for the purpose of receiving deliveries from Stockport. They were temporarily accommodated at Barton.

The existing Hayes and Hamble works had been considerably enlarged, as had the airscrew plant.

Among other statements made by Sqn. Ldr. Wright was the one that a certain type of Fairey aircraft was to be made by an important firm in the shadow industry.

* * *

At the meeting of **Airspeed (1934), Ltd.,** also held on the last day of 1936, the chairman, Mr. George Wigham-Richardson, said he was disappointed to have to present accounts showing a loss on the year's trading. He then proceeded to give reasons for this state of affairs, which, he said, was due almost entirely to the smallness of the turnover. Orders had been received from the Government for three different types of military aircraft, but it was not possible to anticipate the time which would elapse before receiving "instructions to proceed." In the meantime they decided to carry out the necessary extensions to the factory, and, at the same time, to abandon a project for a civil aeroplane of advanced design embodying the combined technique of the latest Fokker and Douglas productions.

In order to keep the works busy while awaiting the "instruction to proceed" it was decided to apply for sub-contract work, but they had been unable to obtain as much as they had wished and as a consequence part of the factory remained idle for a long period. The present position was that they had received an order for two machines, each of two types, upon which they had been working for several months. In respect of a third type they had received an order for a very large number. They estimated the total value of orders on their books at the present moment for both civil and Air Ministry work at about £700,000, so that future prospects would seem to be not unfavourable.

* * *

The meeting of **British Marine Aircraft, Ltd.,** was held on December 30. Air Marshal Sir John Higgins, K.C.B., K.B.E., D.S.O., A.F.C., the chairman, related in detail how the company held the licence for the Sikorsky S.42 flying boat and how five boats were built to fulfil an order. A difficult situation, however, arose as a result of the expansion programme. There was great competition for materials and labour, and the company was badly handicapped. Moreover, the American company had been unable, owing to shortage of material in the States, to deliver certain parts.

The directors accordingly turned their attention to sub-contract work, the importance of which was such that it was desirable to suspend for the time being the building of flying boats. It was found possible to cancel the contract for those ordered on payment of £3,000, while retaining the licence. The company was thus in a position to secure the immediate benefit of sub-contract work, and on this they were now actively engaged.

The total expenditure to date for land, building, and equipment was £120 000, while the present cash resources of the company amounted to £166,000.

Air Marshal Sir John Higgins concluded his remarks by saying that negotiations for amalgamation with another well-known aircraft company were proceeding. The report and accounts were unanimously adopted.

## AERONAUTICAL PATENT SPECIFICATIONS

(The numbers in brackets are those under which the Specifications will be printed and abridged, etc.).

*(Published, December 24, 1936.)*

15236. CANOVA, F. P.: Aeroplane or glider of the rigid all-wing type (457,2[illegible]).

15238. BAYNES, L. E.: Aircraft tail units (457,454).

26553. FAIREY AVIATION CO. LTD., and Voss, E.: Infinitely variable reversing gear box (457,226).

9410. DORNIER METALLBAUTEN GES.: Sheet-metal walls and/or partitions for aircraft (457,369).

*(Published January 7, 1937).*

16358. BENDIX AVIATION CORPORATION: Automatic change-speed mechanism (457,976).

16601. DOWTY, G. H.: Retractable undercarriages for aircraft (457,982).

16602. DOWTY, G. H.: Retractable undercarriages (457,983).

16800. ALKAN, R.: Methods of and means for automatically controlling vessels, aircraft, and the like (458,090).

16950. COCHRANE, A. S.: Ornithopters (458,104).

17202. DOWTY, G. H., and GENERAL AIRCRAFT, LTD.: Retractable undercarriages (458,122).

18712. METALLISATION, LTD., and BALLARD, W.E.: Prevention of corrosion of aircraft (457,938).

22580. HEIDE, H. C. (Deutsche Edelstahlwerke Akt.-Ges): Aviation crankshafts and other machine parts subjected to high vibratory stresses (457,86[illegible]).

25347. FAIREY AVIATION CO., LTD., LOBELLE, M. J. O., and VOSS, E.: Operating gear for movable elements or accessories of aircraft (457,989).

27209. ATWOOD, H. N.: Tubular structural elements or units and processes of making the same (457,947).

9451. ELECTRONMETALL GES.: Adjustable struts for aircraft (458,005).

15752. ROHRYLOWERK GES. FÜR DRAHTLOSE TELEGRAPHIE, VORM. BLANCHARD & GER. ROTHE GES.: Control device for aerial winding mechanism of aircraft (458,018).

## CHANGE OF TITLE

COMPER AND WALKER, LTD. (Aircraft manufacturers, etc., 325/8, Caxton Chambers, 86, Strand, London, W.C.2.).—Name changed to Comper Aeroplanes, Ltd., on December 9, 1936.